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1936

FORTY-SEVENTH YEAR OF PUBLICATION

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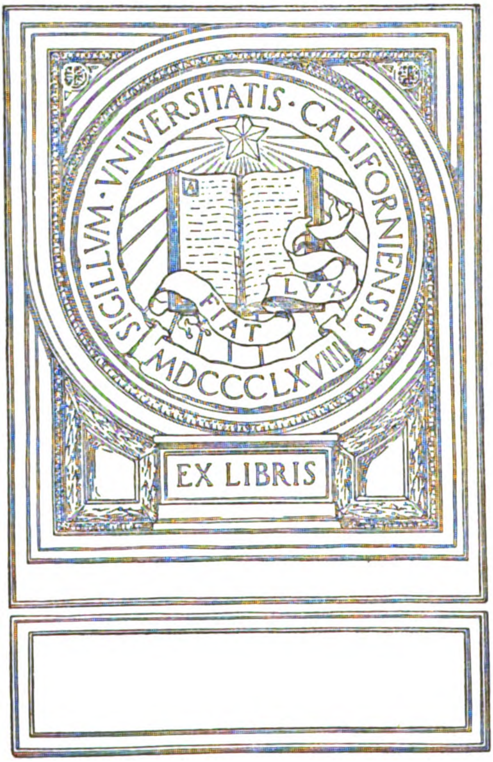
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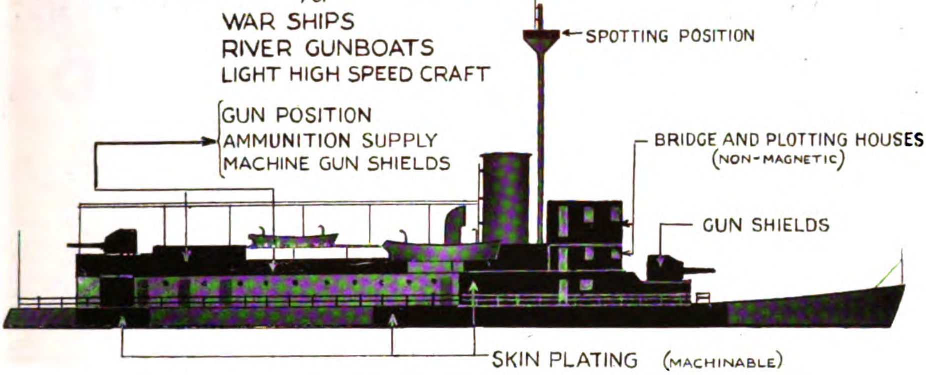

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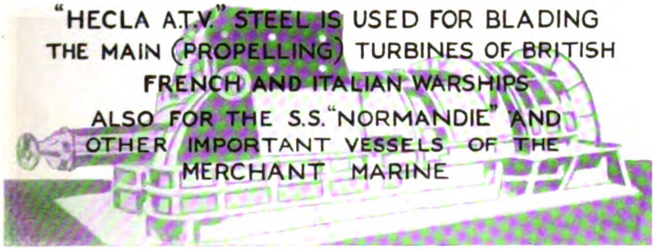

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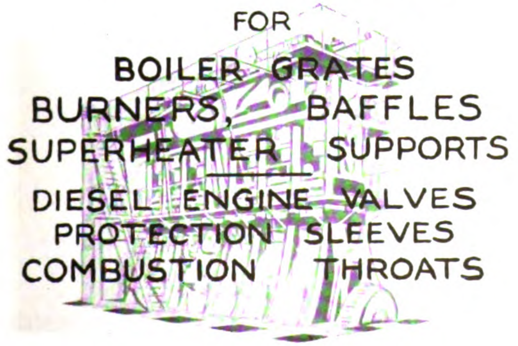

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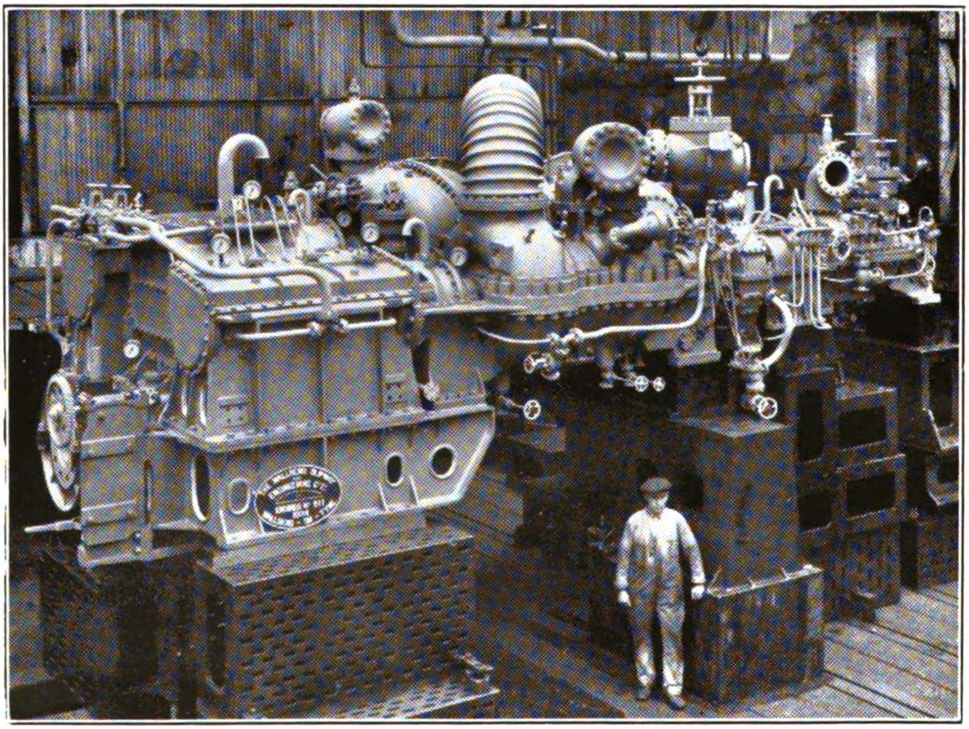

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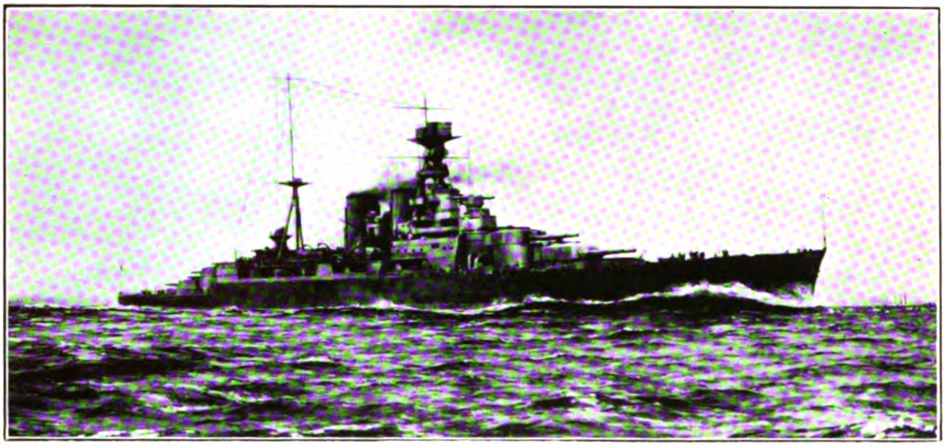

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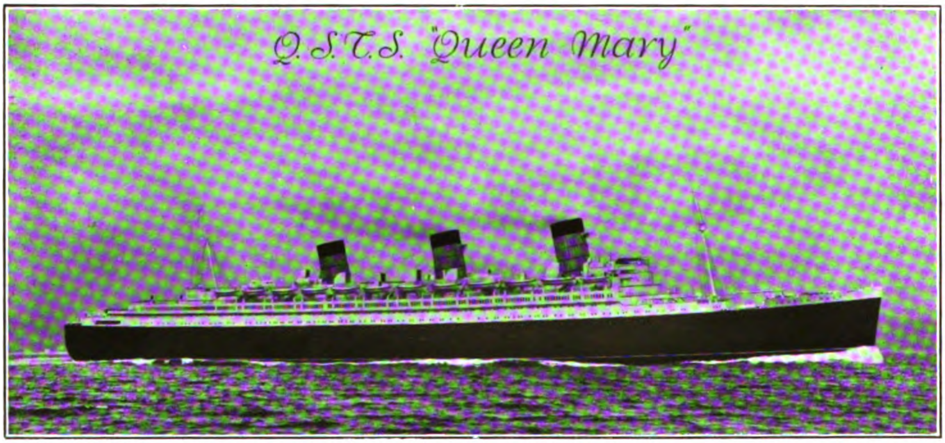

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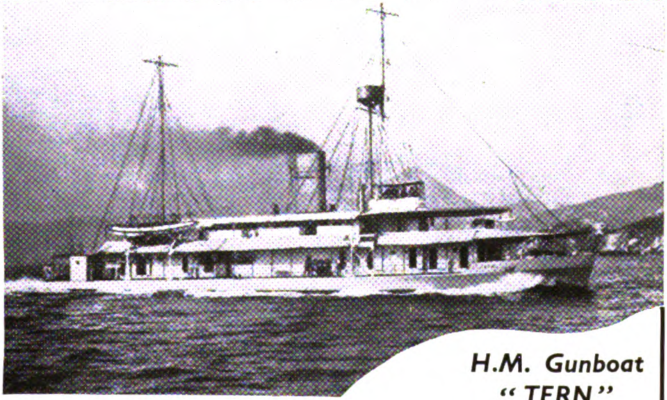

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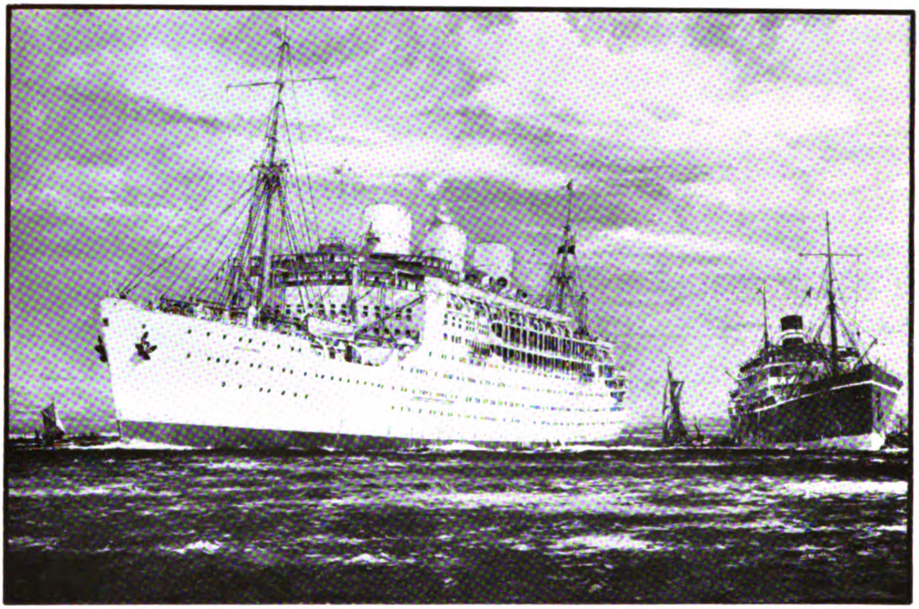

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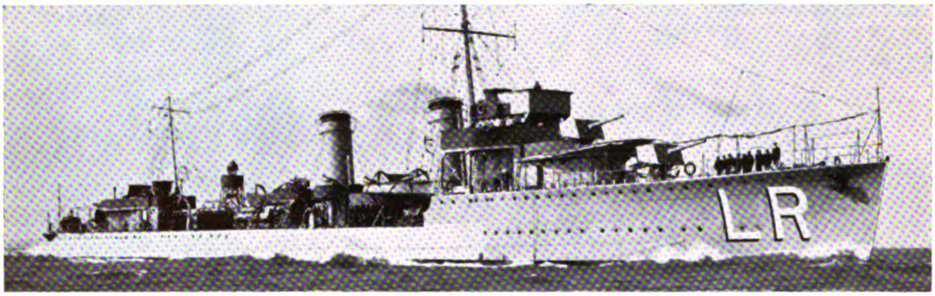

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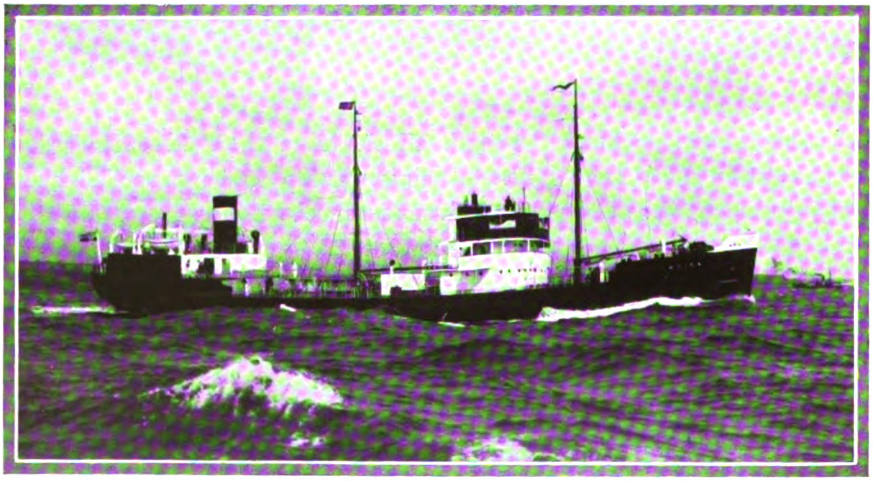

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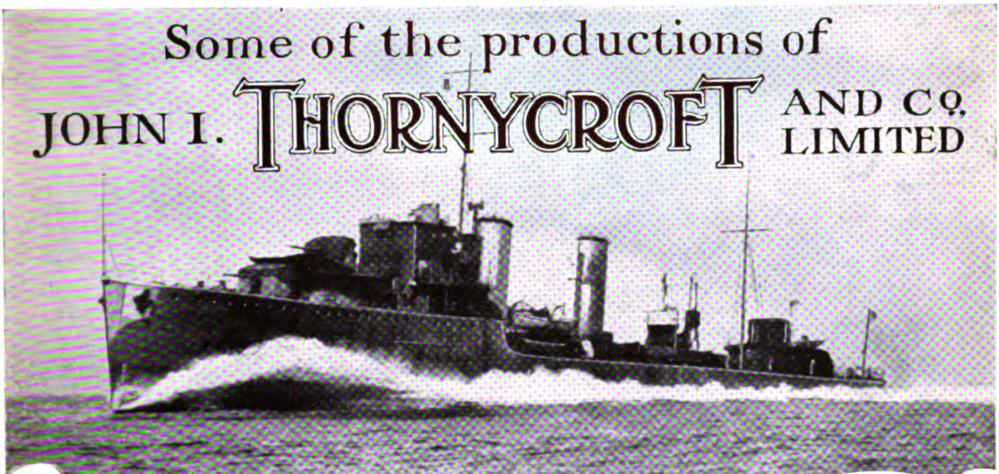

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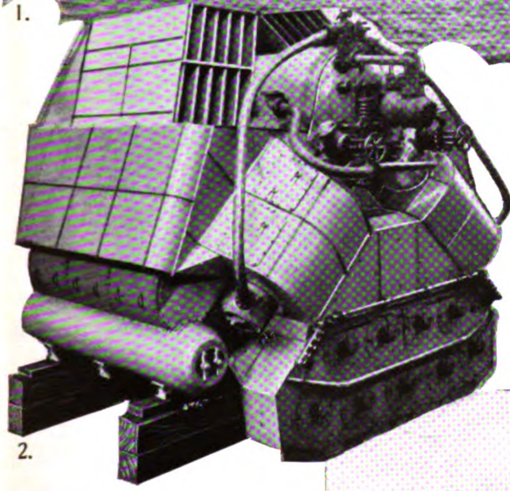

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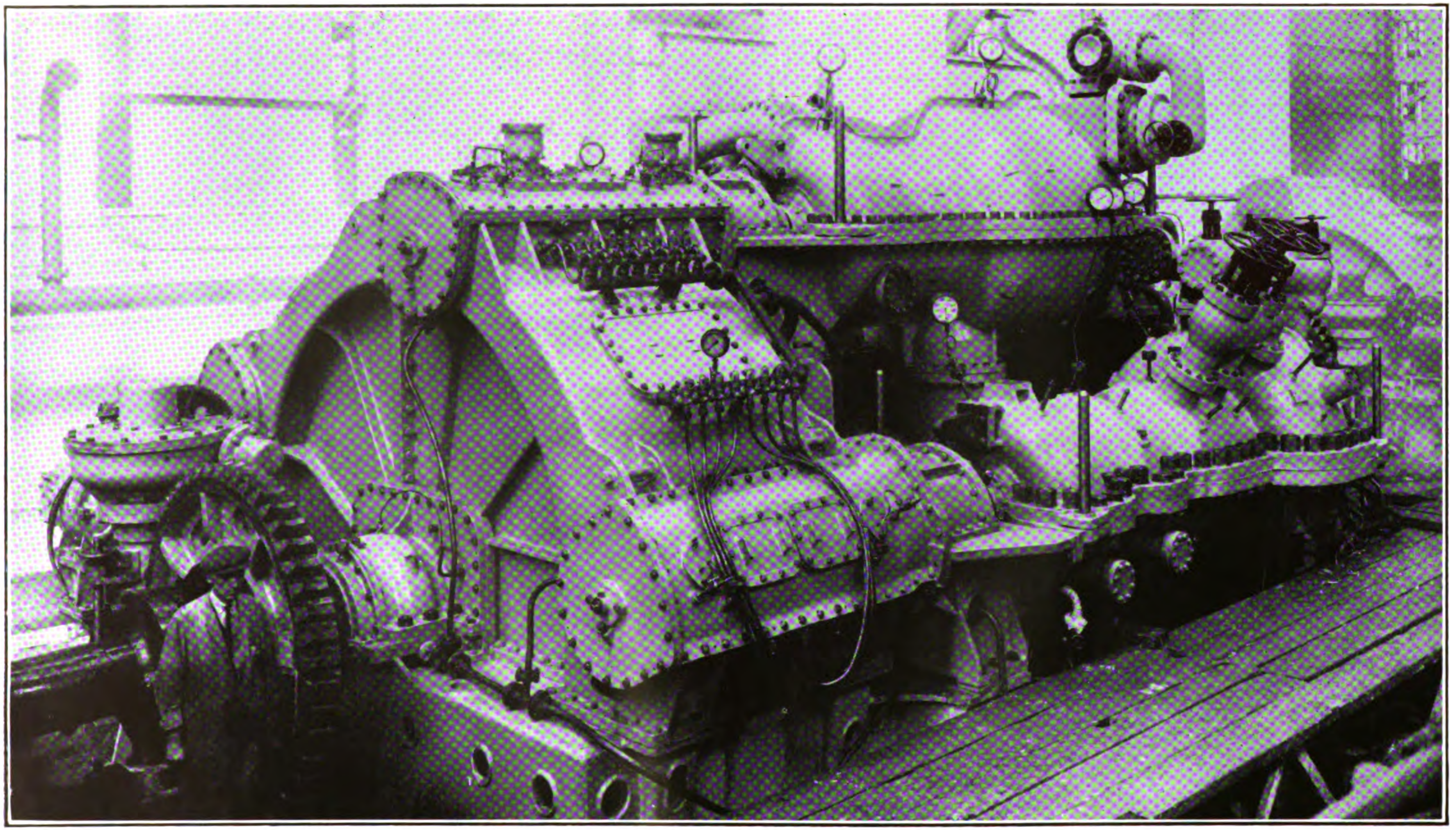

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BRASSEY'S
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1936

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COMMANDER CHARLES N. ROBINSON, R.N.

UNIV. OF
CALIFORNIA

FORTY-SEVENTH YEAR OF PUBLICATION

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PREFACE.

In this, the jubilee year of "Brassey's Naval Annual," founded by the first Lord Brassey in 1886, certain changes have been made in the appearance and composition of the book. A return has been made to the original title of "Naval Annual" in place of "Naval and Shipping Annual;" which had been used since 1920. Although the change then made broadened the basis of the work and emphasised the close connection between the combatant and merchant branches of the Sea Service, yet the term "Shipping" in the title was indistinctive; it represented neither the Mercantile Marine nor the Royal Naval Reserve. The old title now revived is more distinctive. It indicates the aim of the volume throughout its history—a reference work on the Navy and an open forum for the discussion of questions affecting its policy, progress and welfare. Although "Shipping" disappears from the title, this does not mean that the Mercantile Marine disappears entirely from the book. Apart from its other connections with the Royal Navy, it is the basis of the Royal Naval Reserve, and a chapter on this subject, by Captain H. S. Lecky, C.B., A.M., R.N., author of "The King's Ships," has its appropriate place in the volume.

A second change which will be noted is the enlargement of the Naval Air Section, introduced for the first time last year. Of the importance of this branch of naval activity there can be no question, and it is fitting that it should be allotted more space. Most of the officers who contribute to this section prefer to remain anonymous, but each has an intimate and up-to-date knowledge of his subject, and their work forms a particularly valuable part of the issue. Problems of naval air power, and especially of the control of naval air power, are not peculiar to this country, and in response to an invitation Rear-Admiral Ernest J. King, Chief of the Bureau of Aeronautics in the United States Navy, has very kindly supplied an article giving the reasons why that Service retains complete control of its own air arm. British naval air progress is again described by "Volage," who, with more space at his disposal, has been able to enter more fully into the important questions discussed. The notes on Foreign Fleet Air Arms are contributed by the same officer as last year.

A third change which has been made in the "Annual" this year relates to the date of publication. Instead of being published in January among numerous other works of reference, it now appears early in the financial year in April—a reversion to pre-War practice, which enables details of the Navy Estimates to be included in the issue for the same year as that in which they are published. The changed date of publication is particularly timely this year in view of the increased interest and importance of problems of defence. It is hoped that the book will prove useful in supplying information to speakers and writers in connection with debates in Parliament or discussions in the Press or on the platform.

In the Naval Section I have again been favoured with the hearty co-operation of contributors whose work has been a feature of " Brassey " for some years past. Captain Edward Altham again reviews the progress of Foreign Navies; Mr. G. H. Hurford notes the changes of the year in regard to relative naval strength; and Captain Alfred C. Dewar continues his critical analysis of the movements towards naval limitation. Complementary to the last-named is the article on the naval aspect of sanctions by Rear-Admiral H. G. Thursfield. Continuing a series on departmental work in the Navy, Mr. W. E. Clayton, O.B.E., late Assistant Director of Victualling at the Admiralty, describes from his long administrative experience salient changes in this branch during the last 45 years.

By permission of the Director of Naval Construction, Mr. S. H. Watson, R.C.N.C., has again undertaken the revision of the Reference Section, so far as concerns the Tables of British and Foreign Warships and Comparative Naval Strength, with the Profiles and Plans of British and Foreign Warships. I am indebted to the Air Ministry for their courtesy in revising the Lists of British and Foreign Aircraft Types. Many other authorities and correspondents have also been most helpful, and it is a pleasure to acknowledge their goodwill and valuable assistance.

A personal note in conclusion. At the beginning of December, 1935, when the framework of the book had been completed and arrangements made with contributors in regard to the dates for sending in their articles, I was taken seriously ill and have not yet entirely recovered. But my indefatigable secretary, Mr. G. H. Hurford, immediately called in the assistance of my son, Rear-Admiral C. V. Robinson, and Colonel G. C. K. Clowes, head of the firm of Messrs. William Clowes and Sons, Limited, Printers and Publishers of the " Annual " throughout its long history. It was then determined to go on at once with the volume, and if possible to produce it a little earlier than was at first contemplated. Later on, Mr. H. M. Ross, whose connection with the work had been severed with the abolition of the Merchant Shipping Section, most generously undertook to read the proofs, and the issue has therefore had the benefit of his store of literary experience.

As the time for publication approached the Government gave further indications of their determination to bring the Navy up to date; a Supplementary Navy Estimate was published, and also a White Paper on Defence. The text of the latter, and of the German Naval Agreement, will be found in the Reference Section. In addition, in order to make matters quite clear to the reader, Rear-Admiral H. G. Thursfield has supplied a preliminary article on the subject. It is hoped that the information thus summarised will be found useful at the present juncture by all who realise the urgency of the question of British naval defence.

While the book was going to press the new Treaty of London for the Limitation of Naval Armament was signed by representatives of the British Commonwealth, the United States and France, on March 25, 1936. The text of this document and of an accompanying Memorandum by the British Government will be found in the Reference Section.

CHARLES N. ROBINSON,
Commander, R.N.

March 27, 1936.

NEEDS OF DEFENCE:

THE GOVERNMENT WHITE PAPER.

FOLLOWING the procedure introduced in 1935, the publication of the Estimates for the Fighting Services was preceded by the issue of a White Paper dealing with Defence Policy as a whole.* This was the more necessary in that some disquiet had been manifested in Parliament and outside it, arising from doubt whether there was between the Fighting Services the complete co-operation without which the full efficiency of Imperial defence cannot be assured. The doubt had, in part, arisen from, and was certainly fostered by, vociferous and uninstructed advocacy in certain sections of the Press of the views that the development of air forces has rendered obsolete navies in general, and battleships in particular ; that the Navy could no longer fulfil its traditional rôle of safeguarding the external communications of the country ; and that in consequence the money and national effort devoted to its maintenance was largely wasted and could be devoted with better advantage to the Air Force ; and that this disastrous state of affairs was being perpetuated chiefly through the obscurantism of the older services, jealous of being supplanted by a younger upstart and unwilling to surrender any of their privileges or responsibilities. These are extreme views which carry little weight with responsible people. But it was common knowledge that all was not well in the domain of inter-Service co-operation. Differences of opinion upon subjects of fundamental importance were known to exist between the Air Force on the one hand, and the older Services separately on the other, of which there had been some echoes, in a somewhat exaggerated form no doubt, in the views expressed by ex-Service Members in Parliament. Those differences between the Navy and the Air Force had been partially composed by the *modus vivendi* under which the Fleet Air Arm is organised. But it was well known that neither Service was fully satisfied with that arrangement, though both had co-operated loyally to work it ; and that it by no means covered all the questions at issue. It had been alleged by ex-members of the Chiefs of Staff Committee of the Committee of Imperial Defence, that the body, so far as it had settled those questions, had done so only by the methods either of shelving them or of bargaining—by compromise between conflicting views in fact instead of thorough investigation upon which to found an authoritative decision.

It was widely felt that, even if these allegations were only partially true, they revealed a state of affairs which might be dangerous to the security of the country and wasteful of its resources. Some had advocated the view that the only cure for the evils alleged was the creation of a Ministry of Defence—the destruction, in fact, of the whole existing machinery for the control of the Defence Services and the creation of new. This project, however, commanded little support. The Government had never admitted defects in the existing machinery, and the First Lord of the Admiralty was at some pains in the House of Lords on February 11. 1936, to demonstrate that there had been nothing lacking in inter-Service co-operation. Public opinion, nevertheless, proved too strong for this view to prevail. It is generally admitted that there has been in recent years much improvement in this respect, but at the same time there is room, and need, for more improvement yet. Steps are now to be taken to provide for it.

---

* Cmd. 5107, March 3, 1936. Reprinted in Reference Section.

THE WHITE PAPER.

The White Paper starts by reiterating the statement in its predecessor that

> the establishment of peace on a permanent footing is the principal aim of British foreign policy. The first and strongest defence of the peoples, territories, cities, overseas trade and communications of the British Empire is provided by the maintenance of peace.

The method by which British policy has hitherto endeavoured to ensure peace has been unswerving support of the League of Nations and the promotion of collective security through better international understanding. To that method the Government still adheres and will continue to adhere; but the policy adopted up to 1935 of postponing defence expenditure "which would certainly have been justified and might indeed have been regarded as necessary" in the hope that foreign armaments might also be reduced, has failed of its object.

> Conditions in the international field have deteriorated. Taking "risks for peace" has not removed the dangers of war. We have really no alternative in the present state of the world but to review our defences and to provide the necessary means both of safeguarding ourselves against aggression and of playing our part in the enforcement by common action of international obligations.

The proposals the Government was now making represent nothing more than what is found to be essential in present circumstances. The world-wide responsibilities of the British defence forces are unique. In the Italo-Abyssinian dispute, it was shown how duties may be thrust upon them at short notice in various parts of the world. These duties can only be discharged if adequate provision for them is made, and in deciding the scale of the provision it is impossible to ignore the continued increase in armaments of many foreign countries. In the dispute, despite the efforts of the Government to compose it, the "violent and menacing propaganda in Italy largely directed against the United Kingdom as one of the foremost upholders of the Covenant" coupled with the heavy reinforcement of the Italian garrison in Libya, produced a situation in which the possibility of an incident occurring which might precipitate a conflict could not be ignored. The Government decided "that the best way to secure that no such incident should arise was to guard promptly against it," and therefore strengthened and redisposed the naval, military and air forces in the Mediterranean and Red Sea areas, including Egypt. In so doing they were gravely embarrassed by the accumulated deficiencies in all the Defence Services. "It was only possible to safeguard the position in the Mediterranean and the Red Sea by denuding other areas to an extent which might have involved great risks."

Apart from particular disputes, however, it is impossible to ignore the bearing of the rise in the level of armaments abroad upon the maintenance of collective security. That rise increases the power of the League of Nations, but at the same time it may increase the power of a possible aggressor. Every member of the League must be prepared to contribute to the strength of the whole. "We cannot excuse our own weakness by pointing to the strength of our neighbours." We must maintain our armed forces at a level "high enough to enable us to exercise the influence and authority in international affairs which are alike required for the defence of British interests, and in the application of the policy of collective security."

In Germany, the fact of re-armament is no secret if full details are still unknown. A conscript army with a peace strength of 36 divisions is being created and an Air Force equal to that of Great Britain or France; and though the German Navy is limited to a definite proportion of British Navy by the Anglo-German Agreement, its growth cannot be ignored. In France two-year service has been introduced in the Army. Her Air Force is being remodelled, and great sums are being spent on fortification. The Belgian Army is being strengthened. In Italy over 1,000,000 men are under arms, and the Air Force is being enlarged. The same is true of Russia. In Japan nearly half the budget is devoted to armed forces, which are being still further increased. The United States expenditure on defence has risen to £180,000,000 excluding non-effective votes, which may amount to some 15 per cent. more. Though H.M. Government will not fail to continue their efforts directed to the conclusion of agreements for the limitation of armaments, these increases cannot be ignored in determining their defence programme.

After this demonstration of the justification for the Government's proposals for making good the deficiencies of the Defence Services, the White Paper passes on to outline those proposals in greater detail. "In the case of the Royal Air Force, the new programme with further expansion announced to Parliament on May 22 last was being carried out with the utmost energy and vigour, but in the case of the Navy and Army the steps actually taken had been directed only to making good the worst deficiencies."

The development of the Mediterranean situation, however, rendered a fresh examination of the position necessary, the result of which was to change to some extent the plans already made, and to put an end to the leisureliness of the programme. It was found necessary " to provide as rapidly as possible, the necessary reserves of stores, ammunition and equipment and to organise the industrial resources of the country in such a way as to allow of immediate expansion of productive capacity in case of emergency."

The Navy is " the very foundation of our system of Imperial Defence," and it is now " necessary not only to proceed with new construction at a more rapid rate than in recent years, but also to make good existing deficiencies in ammunition and stores of all kinds," if it is to be capable of fulfilling its function of defending our sea communications. The necessity for this does not arise from the impending expiration of the Washington and London Treaties. Although it is clear that the limitations imposed by the instrument being drafted by the London Naval Conference to replace those treaties will be much less restrictive than those of the expiring treaties, there is no expectation that other Powers will so increase their naval strength as to destroy the existing balance, and the Government's plans do not take any such development into account. It is emphasised that they provide solely for replacement.

It is intended to lay down two new capital ships in 1937, and to continue the process, already begun, of modernising certain existing battleships. Five cruisers will be included in the 1936 programme and the aim is to eventually provide 70 cruisers, of which 10 will be " over-age." A steady replacement of destroyers and submarines is intended, and the present rate of providing sloops and small craft will be maintained. A new aircraft carrier, of a type smaller than those now in service, will be laid down shortly, and the Fleet Air Arm will be expanded considerably, to bring it more nearly to the level of those of other services, those of Japan and the United States in particular. Finally, the personnel must be increased to keep pace with material expansion and to make good present deficiencies; it is expected to rise by the end of 1937 by about 6,000 men.

Turning to the Army, it is pointed out that " the Army has three main functions to perform; it has to maintain garrisons overseas in various parts of the Empire, to provide the military share in Home Defence, including anti-aircraft defence, coast defence, and internal security, and, lastly, in time of emergency or war, to provide a properly equipped force ready to proceed overseas wherever it may be wanted." Compared with 1914, the Army has been reduced by 21 infantry battalions, though our peace commitments are greater than ever before. This has resulted in an undue proportion of service overseas. The Government proposes to raise four new battalions of infantry, and re-equip existing formations, particularly the Field Artillery, with the most modern armament and material. " The Territorial Army, though generally regarded as the second line in our military forces, actually provides the first line in anti-aircraft and coast defence at home." For the present, its reconditioning must yield place to that of the Regular Army, but a start is to be made with the improvement of " its present inadequate equipment and training," and the modernisation of coast defences at defended ports will be accelerated.

" The prime function of the Royal Air Force is to provide an effective deterrent to any attack upon the vital interests of this country whether situated at home or overseas." The programme approved in 1935 was to bring its strength at home up to 123 squadrons with approximately 1,500 aircraft. In view of recent technical developments, certain changes in this programme are to be made which will increase efficiency to a greater extent than is measured by the further expansion—to 1,750 aircraft—now to be made. In addition, 12 new squadrons are to be stationed at " convenient places on the strategic air routes," in order to be available for rapid reinforcement of any threatened area throughout the Empire. Four new auxiliary squadrons will form the nucleus of a force which will co-operate with the Territorial Army ; while the five regular Army Co-operation Squadrons will be expanded to seven, each of 12 aircraft. All these increases in first-line formations call for increased reserves, not only of pilots and ground staffs, but also of the capacity to produce the material of which copious and rapid replacement will be needed in war. Particular attention is being paid to this aspect of expansion.

" In presenting to Parliament a scheme of improved defence so far-reaching in character and likely to involve so heavy a financial outlay, His Majesty's Government desire particularly to stress the fact that these proposals have resulted from a thorough study of the subject of defence as a whole." For this purpose a new Sub-Committee of the Committee of Imperial Defence was constituted, consisting of the three Chiefs of Staff reinforced by the Permanent Secretary to the Treasury, the Permanent Under-Secretary for Foreign Affairs, and the Secretary of the Committee of Imperial Defence. This Sub-Committee reported to the standing " Defence Policy and Requirements " Committee, over which the Prime Minister himself presides, and all the measures hitherto outlined were considered, both in general and in detail, by these two Committees and by the Cabinet itself. " In the opinion of H.M. Government they represent a thoroughly considered and well-balanced whole so far as conditions can be foreseen at this moment." Nevertheless, it is admitted that the present organisation is not all that could be desired. It had become " obvious that in the near future there were bound to be large numbers of important and difficult defence questions requiring unremitting attention " ; and the Prime Minister is quite unable himself to give them unremitting attention, though he is, and must remain, Chairman of the Committee of Imperial Defence and of the Defence Policy and Requirements Committee. It has therefore been decided to appoint a whole-time Minister who shall be Deputy Chairman of these two Committees, and shall be charged with the day-to-day supervision and control, on behalf of the Prime Minister, of " the whole organisation and activity of the Committee of Imperial Defence." This Minister will consult personally with the three Chiefs of Staff and will have the right to convene under his chairmanship the Chiefs of Staff Committee whenever he or they think it desirable. While it is not intended that the Chiefs of Staff Committee should normally meet under his chairmanship, he will supplement its present activities and initiative " by guidance and initiative of his own, his function being to ensure that every aspect is fully considered and that difficulties and differences are frankly faced."

The Joint Planning Committee, which works under the Chiefs of Staffs Committee and consists of the Directors of Plans of the three Services, is to be supplemented by three officers, one from each Service, drawn from those who have passed through the Imperial Defence College. The Secretariat of the Committee of Imperial Defence is also to be strengthened. The Defence Minister will also be Chairman of the Principal Supply Officers Committee.

The co-ordination of Defence, however, is not a matter of the fighting Services alone. Provision must also be made, and plans must be elaborated, for the organisation of the industries of the country upon which the Services depend for the supplies without which they are impotent. On the one hand it is necessary to carry through the present programme of re-expansion of the Services without impeding the course of normal trade, or leaving industry disorganised when the process is complete. On the other hand, if the tragedies of 1914 which arose from shortage are to be avoided, unless immense reserves of ammunition, etc., are to be accumulated against the sudden large expenditure which follows the outbreak of war, industry must be so organised that it can quickly supply that huge expenditure when called upon. The accumulation of enormous reserves is an unsatisfactory method, not only because of expense, but because such accumulations may well become obsolete before occasion arises for their use. Therefore:

> The method of procedure contemplated is to select a number of firms who do not normally make warlike stores, but who are suitable for the purpose by reason of their experience and their possession of a skilled staff of engineers and workmen. Arrangements would then be made with these firms for the laying down of the necessary plant and machinery for a given output of selected articles and sufficient orders in peace time would be guaranteed to allow of the requisite training in the work of production.

The Government's plans cover two other contingencies. They will arrange with the industries concerned that " vital processes are not held up for the want of the necessary craftsmen." And being " determined that the needs of the nation shall not serve to pile up extravagant profits for those who are called upon to meet them," they will institute a system of costings and audits to provide against any such abuse. This will be carried out under the constant supervision of the Treasury.

In conclusion, the White Paper emphasises the flexibility of the whole programme. Present plans may well require modification with technical progress, or a changing international situation, which will be kept constantly under review. But in any case Parliament and the country are warned that " in the absence of any scheme for general disarmament, it must be anticipated that the annual cost of maintenance for the reorganised Services must remain at a higher level, and will in all likelihood substantially exceed the original estimates about to be submitted."

THE SUPPLEMENTARY ESTIMATE.

Before the publication of the normal Navy Estimates, a Supplementary Estimate for £4,850,000 was presented to Parliament on February 12, to cover the amount by which the expenditure already authorised had been exceeded. This excess followed chiefly from the emergency in the Mediterranean to which reference was made in the White Paper, not solely through expenditure actually incurred there, but also because the emergency made it a matter of urgency to replenish at once the deficiencies which had been allowed to accumulate during the years of retrenchment. The concentration in the Mediterranean upset the normal arrangements for the relief of personnel, and necessitated an immediate increase in numbers; Vote A was increased by 3,500. Shortages of ammunition and stores had to be made good forthwith; more fuel to the value of £240,000 had been used.

Six motor torpedo boats had been ordered and 20 trawlers purchased for immediate service, and at the same time the shortage of destroyers in service became so marked that the Admiralty decided to lay down seven additional ones forthwith. Maintenance of the Mediterranean Fleet in what was practically a condition of mobilisation involved heavy additional expenditure upon maintenance and refitting work in the dockyards.

At the same time, greater progress than had been expected was made with contract work at home—it is a normal process for this, if it occurs, to be covered by a Supplementary Estimate—and the decision to restore cuts in both Civil and Naval pay, which had been taken since the presentation of the 1935 Estimates, accounted for £354,500. There was a small saving of £2,700 on Vote 6, Scientific Services, and a more substantial one of £232,000 on Vote 10, Works and Buildings, but the net increase was the substantial figure quoted.

THE NAVY ESTIMATES, 1936.

The 1936 Navy Estimates were published on March 4, the day after the White Paper. Their total was £69,930,000; £9,880,000 more than the original estimate for 1935, or £5,030,000 more than the total of original and supplementary estimates for last year. This, however, was not the full tale of the increase proposed, for the estimates as published made no provision either for the normal year's programme of new construction or for the further proposals for making good deficiencies in the Defence Services foreshadowed in the White Paper. It was known that the year's programme of new construction was to be greater than those of recent years. The White Paper announced that two capital ships were to be laid down early in 1937 and an aircraft carrier at an early date. Even if these vessels did not come into the current year's programme, it was to provide for five cruisers as against the three or four of preceding years; while the "steady replacement" of destroyers, submarines and smaller craft would presumably be continued at an increased rate. It was therefore to be expected that the latter part of the financial year would see the introduction of a Supplementary Estimate much higher than that presented in February.

The increase over 1935 in the year's Estimates was explained in the First Lord's covering statement * as being required for the following purposes. £4,645,109 was for progress with new construction already authorised. This was a natural result of increasing programmes and acceleration of work. £1,082,000 (a figure which differs slightly from that extracted from the Estimates themselves) for re-equipment and maintenance, which included not only repairs and refits, but also the completion of the equipment of existing ships for defence against air attack—which was well known to have been seriously in arrear. £216,700 was for the automatic increase in the non-effective votes.

Vote A—numbers borne—was increased by 4,613, a figure which included the increase of 3,500 already made under the Supplementary Estimate.

The necessity for much of this increase arose from the practice, first introduced when Mr. Winston Churchill was at the Treasury, of relieving each year's expenditure by postponing as much of it as possible to future years. In pursuance of the practice, it had become habitual for the new ships of each year's programme to be laid down only at the extreme end of the financial year in which they were announced, or even in the early part of the following year. That procedure gained for the Treasury what was practically a blank year in new construction costs. But the bill has to be paid some day. It is obviously the only course compatible with honest finance and realism in policy to carry out each year's programme when it is authorised, though of course it entails paying the bill at the time. It is a matter for satisfaction that the sound practice is being resumed. The resumption entailed a substantial increase in the year's expenditure, but at least it puts an end to the piling up of future commitments.

The First Lord's statement * as usual reviewed the naval events of interest of the past year, beginning with the participation of the Navy in the celebrations of the Silver Jubilee of His late Majesty King George V of which the chief feature was the Royal review of the Home and Mediterranean Fleets at Spithead on July 16, 1935. The conclusion of the Anglo-German naval agreement in June, 1935, was mentioned, together with the progress made to date by the London Naval Conference. Changes in the distribution of the fleet, completed or projected, were then set forth. These were due partly to the redistribution of capital ships between the Mediterranean and Home Fleets announced last year, partly to the normal changes necessitated by recommissioning and repairs, and partly by the concentration in the Mediterranean referred to in the White Paper.

Of the "Queen Elizabeth" class, the Queen Elizabeth, Barham

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* Cmd. 5105. Reprinted in Reference Section.

and Valiant had joined the Mediterranean Fleet, while the Warspite and Malaya were still under large repair, due to complete in March, 1937, and December, 1936, respectively. The Ramillies, Royal Sovereign, and Resolution had joined the Home Fleet, and the Revenge had also returned home. The Royal Oak was under large repair, due to complete in August, 1936, when the Revenge would be taken in hand. The Hood and Renown were in the Mediterranean, the latter to be taken in hand for large repair in May, when she would be replaced by the Repulse, whose large repair would then be complete. Of these large repairs, those of the Warspite and Renown were stated to include re-engining, and re-boilering, which probably indicated that their refits amounted to what was referred to in the White Paper as "modernisation." The re-shuffling of capital ships, decided a year before, would thus appear to be complete, but for the temporary disorganisation due to large refits.

Of cruisers, mention was made of the Arethusa and Galatea passing into service in 1935 and joining the 3rd Cruiser Squadron in the Mediterranean, though the latter had temporarily exchanged duties with the Despatch, flagship of the Mediterranean Destroyer Flotillas. The Southampton and Newcastle were to join the 2nd Cruiser Squadron in the Home Fleet on their completion early in 1937, while the Amphion, whose completion had been delayed by defects arising during trials, would become flagship on the African Station in July, 1936. Changes in the distribution of cruisers already in service, already made or projected, due to the normal recommissionings or refits, were reported as usual.

Of light craft, the next new Flotilla of destroyers—the "Greyhound" class, due for completion by April—were destined for the Home Fleet, to be transferred later to the Mediterranean Fleet where they would replace destroyers of war time construction. The next flotilla—the "Hero" class of 1934 programme—were also destined for the Home Fleet. Delivery of new submarines was proceeding satisfactorily, as were those of sloops.

Units of Dominion navies were included, with the concurrence of the Dominion Governments, in the concentration in Near East and Mediterranean. H.M.A.S. Australia was already serving with the 1st Cruiser Squadron before the emergency arose, and had been replaced in Australian waters by H.M.S. Sussex; the latter rejoined the 1st Cruiser Squadron. H.M.A.S. Sydney, which had first been commissioned on completion by the company of H.M.A.S. Brisbane, joined the 2nd Cruiser Squadron at Gibraltar instead of going straight to Australia. She has since joined the Mediterranean Fleet at Alexandria. H.M.S. Diomede, of the New Zealand Division, replaced H.M.S. Colombo, which had been withdrawn from the East India station, at Aden. It had been arranged for the Diomede and Dunedin of the New Zealand Division to be replaced in due course by the Achilles and Leander.

Scientific services had as usual received attention. Eight surveying vessels had been in employment; a new method of tidal prediction, devised by Dr. Doodson of the Liverpool Observatory and Commander Warburg, R.N., of the Hydrographic Department, was being brought into use; the non-magnetic vessel Research was to be built shortly; in collaboration with the Air Ministry improvements were being introduced into the Meteorological service; and the equipment of H.M. ships with modern automatic aids to navigation was proceeding.

Much stress was laid upon the progress made in co-operation between the Services, both at the various educational establishments and in combined exercises. The efficiency of the control of anti-aircraft guns was expected to be materially increased as the result of joint investigations by the Navy and the Royal Air Force.

Under the heading of "Fleet Training and Naval Air Work" a tribute was paid to the results achieved by the Fleet Air Arm in the extended manœuvres which took place in the Atlantic in March, 1935. "The value of the Fleet Air Arm to the Navy, the advantage which superior numbers of sea-borne aircraft confer on a Fleet, and the necessity for their adequate Naval training, were again clearly demonstrated."

Twenty-nine ships have been fitted with catapults, and carry between them 37 aircraft.

Personnel was being increased in all branches, and two new departures had been made in the arrangements for training. The ketch Tai Mo Shan, which was built at Hong Kong and sailed home by five naval officers, had been brought into the Service and employed in giving junior officers experience in cruising under sail; one battleship being used for the sea training of boys passing out of the training establishments, and it might be necessary to employ more ships on that service owing to the increasing number borne. Prospects of advancement in all branches were good.

The Statement concluded with a summary of the progress made on new ships under construction, in which mention was made of the new Motor Torpedo-Boats ordered under the Supplementary Estimate, and of the various makes of fast petrol-driven boats which were in future to be the standard type of ship's boat.

Of the 1931 programme two cruisers, the Ajax and Arethusa, were already in service. The third, the Amphion, was due for completion in July, 1936. Of the 1932 programme the three cruisers, Apollo, Sydney and Galatea, the flotilla leader Faulkner and eight destroyers of the "Fearless" class, the three submarines Clyde, Salmon and Snapper, and the destroyer Depot Ship Woolwich were all completed.

Of the 1933 programme, the cruisers Southampton and Newcastle should be completed in March, 1937, and the cruiser Penelope in September, 1936. The flotilla leader Grenville and eight destroyers of the "Greyhound" class would all be delivered by the end of March, 1936, as should the submarines Narwhal, and Seawolf. The submarine Grampus should complete in November, 1936. Five sloops of various classes, including the new Enchantress, were complete.

Of the 1934 programme, four cruisers, the Sheffield, Glasgow, Birmingham and Aurora, should be launched during 1936. The flotilla leader Hardy and eight destroyers of the "Hero" class should be completed by the end of 1936, and the submarines Rorqual, Spearfish and Sunfish shortly afterwards. Five sloops should be completed during the year.

Of the 1935 programme the keel of one cruiser, Liverpool, was laid in February, 1936, and the orders for Manchester and Gloucester had been placed. Orders had also been placed for one flotilla leader Inglefield, eight destroyers of the "Intrepid" class. the seven new destroyers of the "Tribal" class, and five sloops. The order for the submarine Depot Ship Maidstone would be placed shortly.

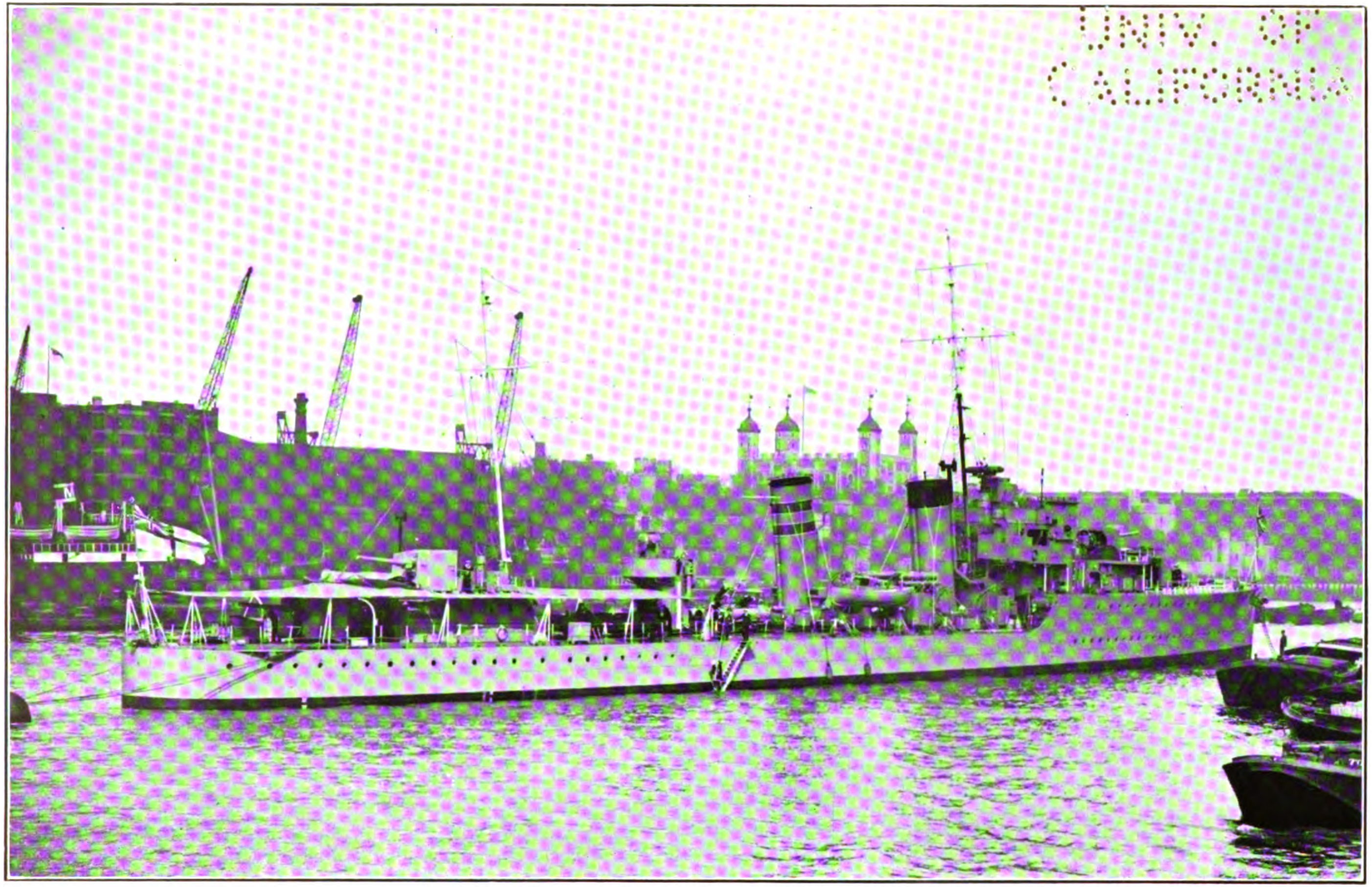
In the Estimates themselves, every Vote shows some increase, most of them substantial except Vote 7, for Royal Naval Reserves, which is up by £200 only. The most notable increases are in Vote 4, Fleet Air Arm, from £1,873,000 to £3,066,000 ; Vote 8, Shipbuilding and Maintenance, from £22,357,300 to £27,265,300 ; and Vote 9, Naval Armaments, from £4,800,000 to £7,115,300. Vote A, for number borne, is up, as already noted, by 4,613, and this causes automatic increases in Vote 1, Pay and Wages, and Vote 2, Victualling and Clothing, Vote 3, Medical Services, and Vote 5, Educational Services. It is to be noted that the establishment of Flag Officers is to be increased from 39 to 42.

The Estimates, as usual, fill a volume of some 470 octavo pages. They are not always easy of comprehension by those unaccustomed to dealing with them. Some parts of them are given in great detail ; others are curiously reticent ; others are involved to the point of mystification, if not contradictory. For instance, Vote 4, Fleet Air Arm, gives no more than the bare figures of the expenditure, which voted *en bloc* as a "grant in aid" to the Air Ministry to appear in detail in the Air Estimates. But there is a cryptic note at the foot of the single page devoted to Vote 4 to the effect that it includes the sum of £167,000 for aircraft forming the initial equipment of new ships, and continues, "the cost is included in the first cost of the ships." This would seem to imply that it is also accounted for twice over, though of course that cannot be its meaning. Again, although it is possible to ascertain exactly how much any particular officer in an important shore appointment is paid, it is not possible to ascertain the progress made so far on, for instance, the Singapore Base. Vote 10 states the total estimate for the purpose as £7,700,000, of which £1,944,250 will remain to be spent after the end of the financial year. But in addition to the total figure, there is the sum of £993,000 given in italics as coming under Vote 8, and there is no hint given as to whether that additional sum has already been provided or whether it is yet to come ; nor does reference to Vote 8 throw any light on the mystery, and for the full cost of the base it will, of course, be necessary to delve also into the Army and Air Force Estimates.

These features of the Estimates lend strength to the demand, expressed in Parliament, for more co-ordination between the separate Fighting Services. It is to be anticipated that the development in the organisation of the Committee of Imperial Defence, to which reference has already been made, will eventually produce an improvement in this respect, which should do something to guard against the danger that too rigid division of responsibility may leave loopholes for the waste of the resources devoted to Imperial Defence.

H. G. THURSFIELD.

NAVAL SECTION



UNIV. OF CALIFORNIA

[" The Times" Photograph

H.M.S. KEMPENFELT AT THE TOWER.

Jubilee Visit to The Thames, May, 1935.

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CHAPTER I.

NAVAL FORCES OF THE BRITISH EMPIRE.

ON the occasion of his Silver Jubilee on May 6, 1935, King George sent the following message in reply to one of congratulation from Sir Bolton Eyres Monsell as First Lord of the Admiralty :—

> It is especially gratifying to me, on the completion of the twenty-fifth year of my Reign, to receive the congratulations of the Board of Admiralty on behalf of the Royal Navy and Royal Marines and the Royal Naval Reserve. From the depth of my heart I thank all ranks and ratings for their loyalty and devotion.
>
> On this my Silver Jubilee I recall with pride the distinguished service rendered by my Navy within the last twenty-five years, and that of the same spirit and gallantry which has inspired them throughout the history of this country is no less alive to-day.
>
> For fifty-eight years I have had the honour of serving in the Navy, to which I am bound by ties of real personal attachment. I particularly appreciate your kindly reference to the interest of The Queen in the Nursing Service, and I am gratified to think that three of my sons have followed in my footsteps, in starting their education and training in this great Profession.
>
> You may rest assured that I shall continue to take the greatest interest in everything that concerns the welfare and efficiency of the British Navy.
>
> (Signed) GEORGE R.I.

Officers and men of the Royal Navy, Royal Marines, and the Reserve Forces took their share in lining the route of the Royal Procession to St. Paul's on Jubilee Day. From May 15 to 22, a contingent of the Home Fleet visited the Thames. Off Southend there were the battleships Nelson, Rodney and Valiant, the battle cruiser Hood, the aircraft carriers Courageous and Furious, the cruiser Cairo and the destroyer Valorous. Off Gravesend were the cruisers Orion, Leander and Neptune and the destroyers Fame and Fortune. In Tilbury Docks were the destroyers Crusader and Cygnet and the submarines L. 21 and L. 53. Off Greenwich were the destroyers Fearless and Forester. Off Greenhithe were the destroyers Crescent and Comet ; and opposite Customs House, the flotilla leader Kempenfelt.

The Jubilee celebrations included a Naval Review at Spithead, and this took place on Tuesday, July 16. The King, who had arrived at Portsmouth, accompanied by his sons, and had embarked in the Royal Yacht Victoria and Albert on the previous evening, left the South Railway Jetty at 2 p.m., preceded by the Trinity House vessel Patricia and escorted by the Admiralty yacht Enchantress. On his approach, a Royal salute was fired by the Fleet. The yacht procession anchored at the head of the lines to enable the King to receive the flag officers and representative officers of the Merchant Navy. At 4 p.m. the Royal yacht entered the lines, accompanied by the Patricia, Enchantress and other vessels conveying official guests. On the return to the head of the lines at 5.30 p.m., the aircraft of the Fleet Air Arm, led by Rear-Admiral the Hon. Sir Alexander Ramsay, Commanding Aircraft Carriers, flew past. From 10 p.m. until midnight the Fleet was illuminated.

The Fleet included 157 war vessels, of which 47 were from the Home Fleet, 43 from the Reserve Fleet, 36 from the Mediterranean Fleet, and 31 miscellaneous and training vessels, including the new sloop Indus, just completed for the Royal Indian Navy. Included in the Mediterranean total was the cruiser Australia, serving as an exchange ship. The total of 157 included nine battleships, the ex-battleship Iron Duke, two battle cruisers, three aircraft carriers, 18 cruisers, 10 flotilla leaders, 69 destroyers, 22 submarines, and 23 sloops, minesweepers and auxiliary craft.

Imposing as was the Fleet under the command of Admiral Sir William Fisher at the Silver Jubilee, it gave much cause for thought, if not anxiety. Not only were numbers much smaller than on earlier occasions of a similar kind—at the assembly in July, 1914, for example there were 55 battleships, four battle cruisers, and 54 cruisers, although no ships were withdrawn from foreign stations—but the relative ages of the ships were greater in the Fleet of 1935. Only two battleships, the Nelson and Rodney, were of post-War design. Only 8 of the 18 cruisers were of post-War design. The average ages of the destroyers were higher than that of the cruisers. The Review, therefore, while it emphasised the present strength and power of the Fleet, also indicated sharply how this was rapidly passing on account of the age of the ships and of the curtailment over a period of years of the normal replacements.

On July 17, at 8 a.m., the King, in the Victoria and Albert, led the Fleet to sea for exercises and target practice. The programme included tactical movements; heavy gun firing at a towed target by the Barham, Valiant, Hood and Renown; 8-in. gun firing at the Centurion, wireless controlled target ship, by the London, Devonshire, Shropshire and Australia; and anti-aircraft firing at "Queen Bee" targets, both long-range and short-range, by the Nelson, Rodney, Courageous, Queen Elizabeth, Revenge and Ramillies. After the exercises the following message, which was passed by wireless to every ship and Naval establishment in all parts of the world, was received by the First Lord of the Admiralty from the King:—

> At the close of my visit to the Fleet I wish to express to you my entire satisfaction with everything that I have seen, and to all ranks and ratings of the Royal Navy my hearty congratulations and good wishes.
>
> I shall not easily forget the impressive spectacle of the Review, in which I am pleased to think that ships of the Merchant Navy have for the first time taken part, while the success with which the Fleet exercises have been carried out to-day bear witness to the traditional efficiency of the Royal Navy.
>
> These two happy days spent by me at sea, accompanied by my sons, and with the Service to which I have had the honour to belong for so many years, will ever remain one of the most inspiring recollections of my Silver Jubilee.

A feature which made the Review different from all others was the presence of representative ships of the Merchant Navy. Twelve merchant shipping companies responded to the invitations to send ships to take part, and the ships they sent ranged from the Alcantara, Asturias and Atlantis, of the Royal Mail Lines, to the General Steam Navigation Company's Royal Eagle and Crested Eagle. In another group were vessels from the fishing fleets, among them the schooner Bluenose, of the Canadian Banks fleet. Moorings were also allotted to over a score of private yachts, among which was the King's cutter Britannia. On the day of the Review the King received eight masters of the Merchant Navy, including the Commodores of the Cunard, R.M.S.P., and P. and O. lines, and six skippers of the fishing fleets.

The King conferred the following honours on officers of the Fleet after the Review:—G.C.V.O., Admiral Sir William Fisher, Commander-in-Chief, Mediterranean Fleet; and Admiral the Earl of Cork and Orrery, Commander-in-Chief, Home Fleet. C.V.O., Rear-Admiral T. F. P. Calvert, Chief of Staff, Home Fleet; Rear-Admiral L. D. I. MacKinnon, Chief of Staff at Portsmouth; and Commodore (First Class) R. H. T. Raikes, Chief of Staff, Mediterranean Fleet.

The Silver Jubilee Medal issued with the approval of the King to commemorate the 25th anniversary of his accession was ordered to be worn in position between 62 and 63 in K.R. and A.I., Article 171 (K.R. amendment 14/34). The King signified his approval of recipients of the medal having their names engraved at their own expense on the rime of the medal if they so desire.

DEATH AND FUNERAL OF HIS MAJESTY.

His Majesty King George V passed away at Sandringham at 11.55 p.m. on Monday, January 20, 1936. The following message to the Royal Navy was addressed by King Edward VIII on the following day:—

> On succeeding to the Throne, I desire that the Royal Navy and all my other Naval Forces throughout the Empire should know with what gratitude I recall the distinguished services rendered by them during the reign of the King, my beloved Father, and how much I cherish the recollection of the intimate personal association so long existing between my family and that profession to which my Father devoted his youth and early manhood, and in which I and two of my brothers received our early training.
>
> My visits to many parts of the Empire have enabled me to note with pride that loyalty and devotion to duty remain the watchwords of the Royal Navy wherever it is called upon to serve, and that the same great traditions are guiding the development of the Naval Services of the Dominions, India, and of all other forces sharing the Naval Defence of the British Commonwealth of Nations.
>
> Conscious as I am of the great trust reposed in you and confident of your determination never to disappoint that trust, I shall always regard your efficiency and well-being as matters of the highest importance and shall take a deep interest in everything which concerns them. EDWARD R.I.

On the occasion of the funeral of his late Majesty on January 28, the gun-carriage bearing the Royal remains was drawn from Westminster Hall to Paddington Station by a gun's crew of naval ratings from Chatham, under the command of Captain A. I. St. G. Lyster, R.N. At Windsor, on the gun-carriage used at the funerals of Queen Victoria and King Edward VII, the coffin was drawn by a gun's crew from H.M.S. Excellent, Portsmouth, under the command of Captain A. J. Power R.N. The naval detachment in the procession in London consisted of 24 naval and marine officers, 350 naval ratings, and 150 marines. A contingent of 1,900 naval ratings, 100 R.N.V.R. ratings, and 500 marines assisted to line the route, and were stationed from Westminster Hall to a position 150 yards east of Marlborough gate. Rear-Admiral T. H. Binney, D.S.O., was in command of all naval and marine ranks and ratings on duty in London. Guards of honour were mounted by the Royal Marines at Westminster Hall and by the Royal Navy at Paddington Station. At Windsor, a guard of honour was provided by the R.N. Barracks, Devonport, and a party of boatswains and their mates from the Royal yacht Victoria and Albert piped "Admiral alongside" as the coffin was placed on the gun-carriage, and "Admiral coming on board" when the cortège reached the steps of St. George's Chapel.

On the evening of the funeral, King Edward conveyed his thanks to the Navy in a message through the First Lord of the Admiralty, as follows :—

> His Majesty the King has commanded me to express his profound satisfaction that it was possible for the Royal Navy and Royal Marines to be so fully represented at the funeral of his beloved Father. His Majesty noted with pride and gratification the fine bearing of all those who were on duty on this solemn occasion.
>
> The King feels that it was particularly fitting that the gun-carriage was drawn on the last journey from Westminster Hall to St. George's Chapel, Windsor, by men of the Service in which his Father spent so many years of his life.

ROYAL WEDDING.

On the occasion of the marriage of the Duke of Gloucester to Lady Alice Scott, third daughter of the seventh Duke of Buccleuch, in November last, a set of dining-room chairs was presented to His Royal Highness as a wedding present from the Royal Navy and Royal Marines, Royal Australian Navy, Royal Canadian Navy, New Zealand Division of the Royal Navy, South African Naval Service, Royal Indian Navy and members of Queen Alexandra's R.N. Nursing Service. In acknowledging the gift in a letter to the First Sea Lord, the Duke said : "I have during the last few years spent many happy days at sea and this gift is the last of many kindnesses that I have received from members of the Senior Service.

. . . I shall always value these chairs not only on account of their intrinsic value but on account of the sentiments which prompted the gift, and my happy associations with the Navy."

I.—THE BRITISH NAVY.

NEED FOR RECONSTRUCTION.

The year 1935 will be looked back upon as a turning-point in the history of the modern Navy, for it was then that the nation first realised the extent to which reductions in fleet strength over a period of years had reduced the Empire to a position of weakness. The Disarmament Conference had proved fruitless, collective security as a practical formula was still afar off, and meanwhile the strength of the Navy—partly owing to reductions in its establishment at the various Conferences, partly to the failure to replace ships as they became obsolete, and partly to the increased construction in other countries—had dwindled to its lowest ebb since the passing of the Naval Defence Act of 1889. That the policy of renewing British defences commands support from the overwhelming majority of the people was proved by the Election in November, 1935, at which this was a cardinal point in the programme of the Government.

The need of rebuilding the Navy was emphasised by various Cabinet Ministers before and during the General Election campaign. The Chancellor of the Exchequer, Mr. Neville Chamberlain, said at Floors Castle, Kelso, on September 21, 1935 :—

> We have tried unilateral disarmament in the hope that other countries would follow our example. It has proved to be a complete, a costly, and a dangerous failure. The time has come now when we must face realities, when we must bring our forces up to the minimum required for our own self-respect, when we must recognise that, in this workaday world, disarmament must follow and not precede the establishment of a sense of security.

Speaking at Bournemouth on October 4, 1935, Mr. Baldwin, the Prime Minister, said :—

> I ask myself . . . in the responsibility that falls on me as principal adviser to His Majesty, how far I am entitled to accept fully those obligations (under the League of Nations) without repairing those deficiencies which we have made and for which all of us are responsible in the years since the War. It is a responsibility that I cannot bear, I cannot shoulder, and I do not think His Majesty's Government on examination will be prepared to shoulder.

In his first Election speech at Wolverhampton, Mr. Baldwin said :—

> On the question of strengthening the Navy, the programme of replacing pre-War construction with modern ships does not mean an increase. It does not mean increasing the Navy. It means that the designs of our ships will be such as are now designed to meet the danger of aircraft which was not in existence so far as ships were concerned eighteen or twenty years ago. . . Whatever risks may come at any time in fulfilling the obligations of the Covenant of the League, the first forces to feel that risk must be the naval forces of the countries which are participating in giving effect to the obligations of the Covenant, and chief among those countries is our own.

COMPARATIVE COST.

The measure of the effort made by the British Government in the direction of disarmament is indicated by the totals of the Navy Estimates since the War. In 1925 the actual expenditure under Navy votes was £60,004,548. In 1932, it had declined to £50,164,453, a reduction of nearly ten millions. On paper, this figure appears a large one, and is often compared adversely with that of pre-War days. The last Estimates before August, 1914, amounted to £51,550,000. But comparison of the figures alone does not afford a true contrast, owing to the great rise in wages and prices and the numerous technical developments which have been made since the War, and which are much more costly to provide and maintain. In 1912, for example, the pay of the Navy, numbering 136,000 officers and men, cost less than £7,750,000. In 1935, though numbers had declined by over 40,000, the pay was not far short of £13,000,000. The same thing may be observed in the civil establishments. In 1914, when pre-War construction and repair were at their height, the dockyard personnel cost under £4,000,000 ; whereas in 1935, with no battleship construction in progress and with a much smaller fleet to maintain, the dockyard personnel cost nearly £7,000,000. A light cruiser in 1914 cost about £330,000. It costs nearly as much to-day to build a destroyer. A cruiser of similar tonnage to that of 1914 costs between three and a half and four times as much. This is due in part to higher wages and prices, but mainly to the far greater requirements in regard to armament, protection, communications, and aircraft. Naval reconstruction, therefore, is bound to be costly, but it is a necessary insurance, far less costly than war, and it must always be remembered that over 85 per cent. of the cost goes directly into industry and thereby stimulates trade and prosperity.

BATTLESHIP CONSTRUCTION.

As the time approaches when the Admiralty must resume battleship construction in order to replace ships now becoming obsolete, several authorities have re-affirmed the importance of the capital ship to the work of the Navy. The Government White Paper, " Statement Relating to Defence," issued on March 4, 1935 (Cmd. 4827, price 2*d.*), over the initials of Mr. Ramsay MacDonald, then Prime Minister, said : " The capital ship remains the essential element upon which the whole structure of our naval strategy depends. The age of our battleships renders it necessary to commence their replacement at an early date, but the extent of new construction will be subject to any agreement reached at the forthcoming Naval Conference."

In an address to the members of the Institution of Naval Architects on April 10, 1935, the First Lord of the Admiralty, Sir Bolton Eyres Monsell, referred to the capabilities of the modern battleship to withstand air attacks. " Few people realise," he

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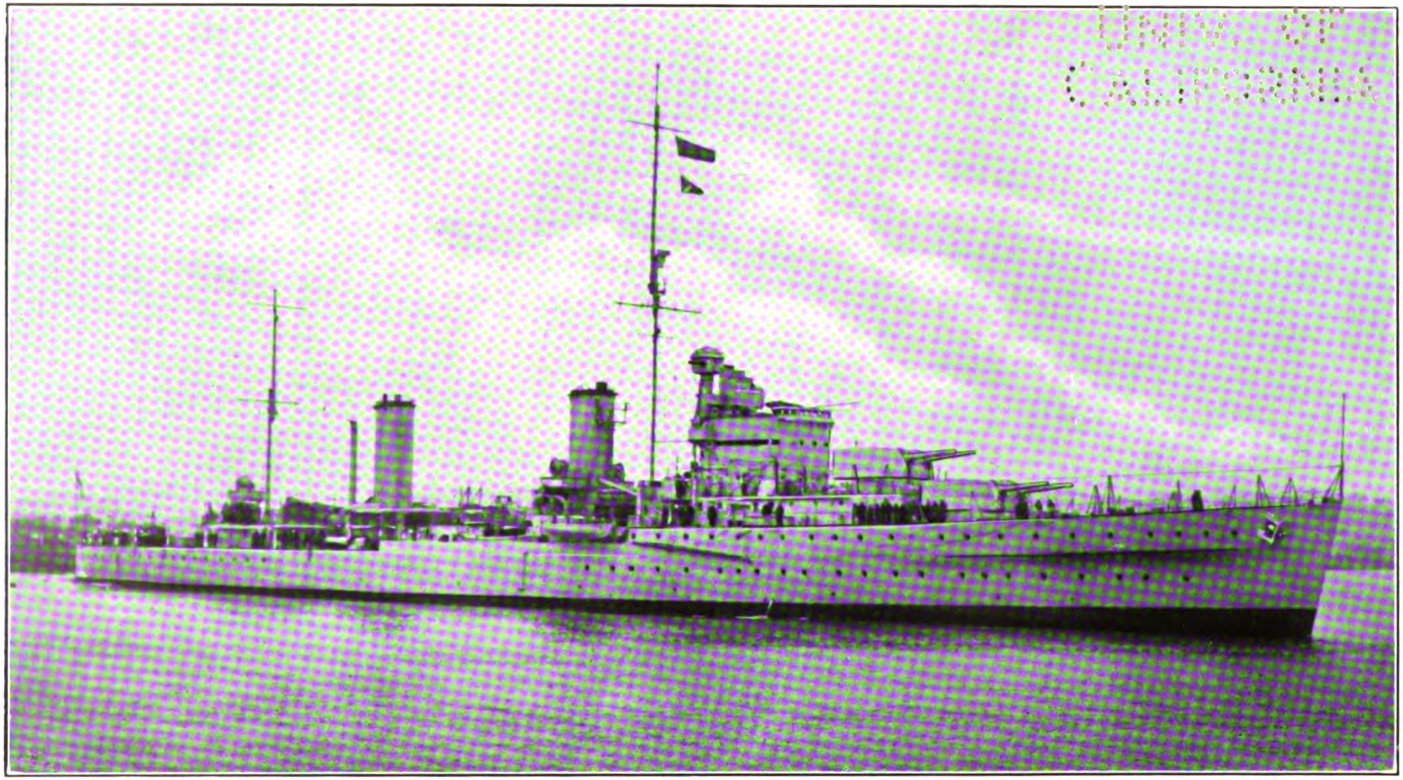


[Photo by Cribb, Southsea.

H.M. CRUISER ARETHUSA, 5,220 TONS.

Built at Chatham; Completed to Full Complement, June 12, 1935.

said, " the great defensive power which even our old battleships have to-day against air attack. The battleship of the future will be a veritable fortress of defence. . . . I am sure that the battleship —not necessarily big ones—will remain the pivot upon which all our ships will perform their historic function."

Cruiser Construction.

Work proceeded during 1935 on the cruisers of five different annual programmes, 1931 to 1935 inclusive, an illustration of the comparatively slow rate of building. Of the three ships of 1931, which were not put in hand until 1933, the Ajax and Arethusa were completed, but the Amphion was still uncompleted at the end of the year. Similarly, of the three ships of 1932, which were also put in hand in 1933, the Sydney (for Australia) and the Galatea were completed, but the Apollo remained uncompleted at the end of the year. The addition to the Fleet during 1935 was therefore four cruisers, a total which, as in the preceding years, was insufficient to replace the wastage, as six cruisers (the Cairo, Calcutta, Colombo, Delhi, Dunedin and Hawkins) attained the age limit of sixteen years during 1935. This aspect of the cruiser output is more fully dealt with in the article on " Comparative Strength."

The Ajax, which commissioned at Portsmouth on April 15, 1935, for the South America Division, was the last of the five cruisers of the " Leander " class, the 7,000-ton vessels which it was hoped would become the standard type of large cruiser in the Royal Navy had not foreign developments obliged an increase in displacement. The Amphion and Apollo, with the Sydney for the Australian Navy, are known as the " modified Leander type." They are of the same general design, but with a re-arrangement of the machinery and boiler rooms, and with two funnels instead of one.

The Arethusa, commissioned on May 21 and completed to full crew on June 12, and the Galatea, commissioned on September 3, 1935, are the first pair of the four cruisers of the 5,220-ton class which were to have been produced in some numbers for foreign service, but which have become isolated owing to the general rise in displacement. The Arethusa is the smallest and cheapest type of cruiser built since the War. She is the first in which electric welding has been utilised to any extent and weight has also been saved by the use of aluminium-covered plywood for cabin partitions and other fittings. Advances in machinery practice make her a most efficient and economical cruising unit, able to steam 12,000 miles on one load of fuel. One of her novelties is a fluid flywheel, which enables power to be switched over almost instantaneously from the main engines to the cruising turbines. A catapult is fitted, and both the Arethusa and Galatea have a Hawker Osprey fighter-reconnaissance aircraft.

CRUISERS LAID DOWN.

Four cruisers were laid down during 1935, all belonging to the programme of 1934; they should come into service about the autumn of 1937. The Aurora, last of the four of the "Arethusa" class, was laid down at Portsmouth on July 23. She will be engined by the Wallsend Slipway and Engineering Company. The Sheffield, Glasgow and Birmingham are further 9,000-ton ships of the "Southampton" type. The Sheffield was laid down at the Vickers-Armstrongs yard, Walker-on-Tyne, on January 31, 1935; the Glasgow by the Scotts' Shipbuilding and Engineering Company, Greenock, on April 16, 1935; and the Birmingham at Devonport Dockyard on July 18, 1935. Machinery will be provided by the builders of the hull in the first two cases, and the Birmingham will be engined by John Brown and Co. at Clydebank. It is now confirmed officially that the armament of the "Southampton" class will include twelve 6-in. guns, as compared with eight in the "Leander" class. The anti-aircraft armament will be doubled, eight 4-in. A.A. guns being mounted instead of four. The horse-power has been increased from 72,000 to 75,000, and the designed speed is 32 knots as compared with 32½ knots. The number of torpedo tubes is reduced from eight to six.

CRUISERS LAUNCHED.

Following the large output in 1934, when six cruisers (three each of the 1931 and 1932 programmes) took the water, only one cruiser was launched during 1935. This was H.M.S. Penelope, of the 1933 programme, a third vessel of the "Arethusa" class. The other two cruisers of the 1933 programme are the Southampton and Newcastle, first of the 9,000-ton class, which were laid down in the autumn of 1934, some six months after the Penelope. Their launching dates were March 10 and January 23, 1936. The Penelope was ordered from Harland and Wolff, Belfast, the first warship to be built there since the War. Speaking at the luncheon following the launch by the Duchess of Abercorn, wife of the Governor of Northern Ireland, the Chairman of Harland and Wolff, Mr. F. E. Rebbeck, said that this contract meant that the yard was now definitely recognised as one of the regular warship-building yards of the country. It was, he said, the largest shipbuilding establishment in the world, with foundations and equipment second to none, and it was obvious that there would be no requirement of the Admiralty in the future that it could not meet up to the largest capital ship likely to be contemplated.

CRUISERS AUTHORISED.

Orders were announced on October 22 in connection with the cruisers of the 1935 programme, all of which will be of the "Southampton" class. The Manchester will be built and engined by Messrs. Hawthorn, Leslie and Co., of Hebburn-on-Tyne;

and the Liverpool by the Fairfield Shipbuilding and Engineering Company, of Govan, Glasgow. The Gloucester will be built at Devonport Dockyard, with machinery by the Scotts' Shipbuilding and Engineering Company, Greenock. These ships will make a total of eight of the " Southampton " type, and they should be available for service as follows :—Southampton and Newcastle, spring of 1937 ; Sheffield, Glasgow and Birmingham, autumn of 1937 ; Manchester, Liverpool and Gloucester in 1938.

NEW AIRCRAFT CARRIER.

The beginning of the first aircraft carrier to be specially designed as such for the Royal Navy since the War was an interesting event of the year. This ship, the Ark Royal, was authorised in the 1934 Navy Estimates, and ordered in March, 1935, from Messrs. Cammell Laird and Co., Birkenhead, and her keel was laid on September 16, 1935. She is expected to be completed within three years from the date of laying down. The only particulars yet revealed officially are that the displacement will be about 22,000 tons and that an armament of 5·5-in. guns will be carried. The size of the new ship resembles that of the U.S.S. Yorktown, 19,900 tons, rather than that of the Japanese Soryu, 10,050 tons, both of which vessels were launched during December, 1935.

FLOTILLA LEADERS AND DESTROYERS.

Construction proceeded on flotilla leaders and destroyers during 1935 at the normal rate of replacement since the adoption of the London Treaty, that is, one flotilla a year, consisting of one leader and eight destroyers. There was, however, a slight quickening up of the rate of construction of the vessels in hand. The flotilla leader Faulknor and destroyers of the " Fearless " type (1932 programme) were completed and joined the 6th Flotilla, Home Fleet. The flotilla leader Grenville and destroyers of the " Greyhound " type (1933 programme) were launched on various dates between July 22 and November 12, 1935. The flotilla leader Hardy and destroyers of the " Hero " type (1934 programme) were laid down on various dates between February 27 and April 15, which was approximately six months earlier in the year than those of the 1933 programme. The flotilla leader Inglefield and destroyers of the " Intrepid " class (1935 programme) were ordered in October from the following firms :—Inglefield, Cammell Laird and Co., Birkenhead ; Icarus and Ilex, John Brown and Co., Clydebank ; Imogen and Imperial, R. and W. Hawthorn, Leslie and Co., Hebburn-on-Tyne ; Intrepid and Impulsive, J. S. White and Co., Cowes ; Isis and Ivanhoe, Yarrow and Co., Scotstoun, Glasgow.

An additional flotilla of seven destroyers was also announced. On December 11, 1935, in reply to a question in Parliament, Lord Stanley stated that it was proposed to order a further flotilla of seven vessels later in the financial year, after a Supplementary Estimate had been presented. Provision was to be made in this

Supplementary Estimate for the further flotilla and also for some small vessels which had recently been ordered for the Navy as additions to the 1935 programme.

The following table shows the difference between the " Fearless " class destroyers passed into service, and those of the " Greyhound " class which were launched and are due to come into service early in 1936 :—

	Tons.	H.P.	Speed.	Guns.
Fearless ..	1,375	36,000	35·5	4 4·7-in., 7 smaller guns, 8 torpedo tubes.
Greyhound	1,350	34,000	35·5	4 4·7-in., 7 smaller guns, 8 torpedo tubes.

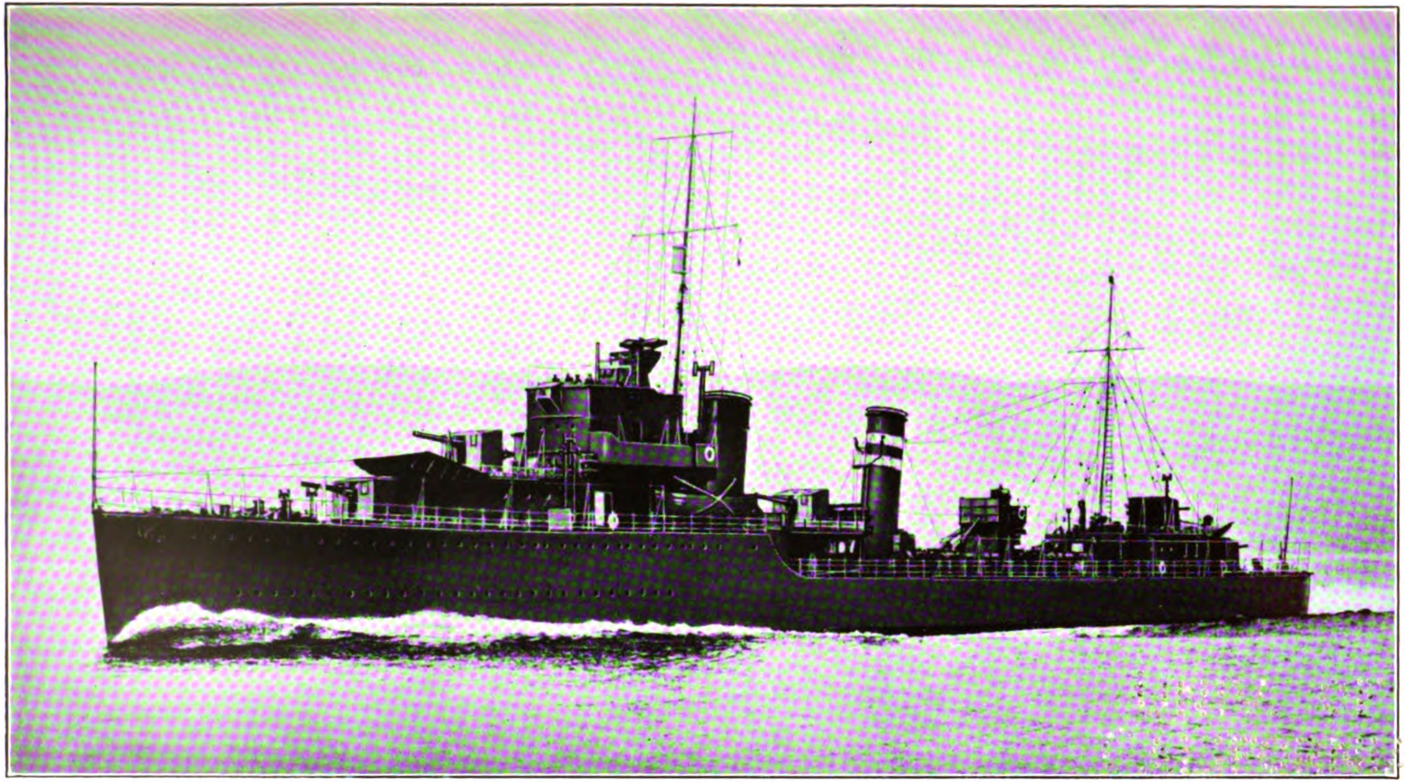
The " Hero " and " Intrepid " types will be repetitions of the " Greyhound " class. The flotilla leaders Faulknor, Grenville, Hardy and Inglefield will be about 100 tons heavier than the destroyers of their respective programmes, and have 38,000 horse-power, with a speed of 36 knots, or half a knot more than the destroyers. They will also carry five instead of four 4·7-in. guns.

SUBMARINES.

During 1935 the submarines of the 1932 programme were passed into service. In this programme were the Clyde, the third of the long-range high-speed submarines of the " River " class, already represented in the Fleet by the Thames and Severn ; and the small coastal quick-diving submarines Salmon and Snapper, of the " Swordfish " class. No further vessels of the " River " class have been put in hand. The programme of 1933–35 included further submarines of the Swordfish or coastal patrol type, minelaying vessels of the " Porpoise " type, and one general service submarine of the " P " type, the Triton, which will be the first of a new group in this category. Dates are as follows :—

	Begun.	Launched.	Date for Completion.
Swordfish type—			
Seawolf (1933)	25.5.1934	28.11.1935	March, 1936.
Sunfish (1934)	22.7.1935	—	March, 1937.
Spearfish (1934)	23.5.1935	21.4.1936	November, 1936.
Sterlet (1935)	—	—	1937.
Porpoise type—			
Grampus (1933)	20.8.1934	25.2.1936	August, 1936.
Narwhal (1933)	29.5.1934	29.8.1935	March, 1936.
Rorqual (1934)	1.5.1935	—	February, 1937.
Cachalot (1935)	—	—	—
Triton type—			
Triton (1935)	—	—	—

Only two submarines were launched during 1935. The Narwhal was put afloat at the Vickers works, Barrow, on August 29, when Mrs. Henderson, wife of Vice-Admiral R. G. H. Henderson, Third Sea Lord and Controller, performed the naming ceremony. The Narwhal was the 167th submarine launched at Barrow. Among those who witnessed the launch were British, Portuguese, Estonian and Rumanian officers who were inspecting important contracts



H.M. FLOTILLA LEADER FAULKNOR.

Commissioned for Service, May 27, 1935.

(By courtesy of the builders, Yarrow and Co., Ltd.)

for their governments. The other launch was that of the Seawolf at the yard of the Scotts' Company, Greenock, on November 28, when Mrs. James, wife of Vice-Admiral W. M. James, Deputy Chief of the Naval Staff, performed the naming ceremony. The Seawolf was the only submarine building at that time in Scotland.

SLOOPS.

The construction of sloops for the Royal Navy proceeded more briskly during the past year, when not only were more vessels completed, but of new types. Those passed into service were five of the "Grimsby" type for general service (two of which were for India and Australia respectively), two of the "Halcyon" type for minesweeping, and the first of the "Bittern" type of convoy sloops and the "Kingfisher" type of coastal sloops. Details of the respective designs are as follow :—

Type.	Tons.	H.P.	Speed.	Guns.
Grimsby . . .	990	2,000	16·5	2 4·7-in., 1 3-in., 12 small.
Halcyon . . .	815	1,770	16·5	2 4-in., 9 small.
Bittern . . .	1,190	3,300	18·0	4 4·7-in., 12 small.
Kingfisher . . .	585	3,600	20·0	1 4-in., 8 small.

Those of the "Grimsby" type completed were the Wellington, Deptford, Londonderry, Indus and Yarra. The Wellington commissioned at Devonport on January 22 for the New Zealand station to replace the Laburnum. The Deptford commissioned at Portsmouth (after being built at Chatham) on August 14, 1935, and visited Deptford to receive a presentation on August 27–28. She then proceeded to replace the Lupin in the Persian Gulf Division. The Londonderry commissioned at Devonport on September 17, 1935, and left on September 30 to replace the Hastings in the Red Sea ; a proposed visit to the port of Londonderry had to be cancelled owing to the ship being urgently required on her station. The Indus and Yarra are referred to elsewhere, under the Dominion Navies.

The two sloop-minesweepers of the "Halcyon" class completed were the Hussar and Speedwell, the former built by Messrs. Thornycroft at Southampton, and the latter by Messrs. William Hamilton and Co. at Port Glasgow. The Hussar was commissioned on January 16, 1935, and the latter on October 4, 1935. Both proceeded to the Eastern Mediterranean later in the year with the First Minesweeping Flotilla.

H.M.S. Enchantress, first of the new convoy sloops, was built by John Brown and Co. at Clydebank, and completed in April, 1935, when she was commissioned at Portsmouth. It had been decided to utilise her as occasional Admiralty yacht, and therefore instead of the regulation grey she was painted black, with white upper works and yellow funnels. The expectation that this new type would carry 6-in. guns was not realised. The design provides for four 4·7-in. guns, but only three were mounted on completion, all forward. A fourth gun can be mounted aft if required, but from amidships aft the Enchantress is adapted as a yacht, with a deck saloon and promenade deck over it. From the rear of the saloon there is access to another small promenade deck or poop, and beneath the saloon is a dining-room. There are cabins and bathrooms for the First Lord and First Sea Lord, and eight other cabins. The Enchantress accommodated members of the Board of Admiralty and their guests at the Jubilee Naval Review.

H.M.S. Kingfisher, first of the coastal sloops, was built by the Fairfield Shipbuilding and Engineering Company at Govan, and was commissioned on June 18, 1935, as an independent command to carry out trials. She was attached to the First Anti-Submarine Flotilla, Portland, temporarily. The Kingfisher is the smallest class of sloop built since the War. Her design resembles that of the "P" boats built during hostilities, and while only a 4-in. gun is carried the type can also make use of depth charges in operations against submarines. The speed is the highest of any post-War sloops (20 knots), but as only short convoy and escort passages, and coastal patrol work, are contemplated, the radius of action is not large. The fuel capacity is 160 tons of oil, compared with 370 tons in the Enchantress, and 280 tons in the "Grimsby" class.

There were fifteen sloops under construction or authorised for the Imperial and Australian Navies at the beginning of 1936, a larger number than in any other post-War year. They belong to four classes, viz., the Aberdeen, Fleetwood and Swan (Australia), of the "Grimsby" type; the Niger, Salamander, Hebe, Hazard, Sharpshooter and Gleaner, of the "Halcyon" minesweeping type; the Stork and Bittern, of the "convoy" type; and the Mallard, Puffin, Sheldrake and Kittiwake, of the "Kingfisher" or coastal type.

The Aberdeen and Fleetwood were laid down on the same slip at the South Yard, Devonport, on June 12 and August 14, 1935, respectively. The Aberdeen was launched on January 22, 1936, when the Lady Provost of Aberdeen performed the naming ceremony. This was the first regular warship of the Royal Navy named after Aberdeen. The Niger and Salamander were laid down by J. S. White and Co. at Cowes in April, 1935. The Niger was launched by Lady Mottistone on January 29, 1936. The Stork, although of the same type as the Enchantress, convoy sloop, with a displacement of 1,180 tons, engines of 3,300 horse-power, and a speed of 18 knots, is intended for service as a surveying ship, and will therefore carry only one small gun instead of four 4·7-in. guns.

COASTAL MOTOR BOATS.

In 1935 the Admiralty placed an order with the British Power Boat Company of Hythe, Southampton, for six coastal motor boats. These are the first vessels of this class to be built for the Royal Navy since 1922, since which time a great advance has been made in their design and power. About 83 C.M.B's. were built during the War, and up to the date of the Armistice thirteen were lost. There were further losses in 1919, when the boats operated in the Baltic and the Caspian Sea. In the raid on Kronstadt on August 18, 1919, three out of eight did not return, but they sank two battleships and a submarine depot-ship, and inflicted damage upon others. This was the operation for which the Victoria Cross was awarded to Commander C. C. Dobson and Lieutenant G. C. Steele.

In a letter to *The Times* on January 13, 1936, Mr. Hubert Scott-Paine, of the British Power Boat Company, stated that "the type of boat which I am building for the British Admiralty is of my invention throughout, is completely new from almost every point of view in its originality, and will, I hope, make a noteworthy development in naval construction."

BOARD OF ADMIRALTY.

In the Official Navy List for July, 1935, it was shown that the Assistant Chief of the Naval Staff had been restored to a seat on the Board of Admiralty. This officer had not been a member of the Board since April, 1929. It was then announced by the First Lord (Mr. W. C. Bridgeman) that an alteration in the constitution of the Board "will be made experimentally. . . . The Assistant Chief of the Staff will cease to be a member of the Board, and will perform his duties under and on behalf of the First Sea Lord. Some financial saving will result from this change." Although no official statement was made concerning the restoration, the experiment of 1929 was evidently not successful.

Another interesting change made at the beginning of the financial year on April 1, 1935, concerned the method of payment of members of the Board. Formerly the naval officers on the Board had been regarded as on half-pay, and the salaries of their offices were rather low in consideration of the fact that they were also in receipt of the half-pay of their respective ranks. Consolidated salaries have now been approved, and half-pay is no longer payable. The 1935 salaries were :—First Sea Lord and Chief of Naval Staff, £4,525 ; Second Sea Lord and Chief of Naval Personnel, £3,350 ; Third Sea Lord and Controller, £3,000 ; Fourth Sea Lord and Chief of Supplies and Transport, £2,750 ; Deputy Chief of Naval Staff, £3,000 ; Assistant Chief of Naval Staff, £2,750. It will be observed that the new salaries are graded according to the relative standing of the members of the Board, whereas formerly it might happen that the Fourth Sea Lord, if a vice-admiral, received more than the Third Sea Lord and as much as the Second Sea Lord.

Three of the six naval members of the Board of Admiralty were relieved during 1935. On February 15, Vice-Admiral P. L. H. Noble became Fourth Sea Lord and Chief of Supplies and Transport, in succession to Vice-Admiral Geoffrey Blake. On September 30, Vice-Admiral Sir Martin Dunbar-Nasmith, V.C., became Second Sea Lord and Chief of Naval Personnel, in succession to Admiral Sir Dudley Pound. On October 29, Vice-Admiral W. M. James became Deputy Chief of the Naval Staff in succession to Vice-Admiral Sir Charles Little. In each case the retiring member of the Board was nominated to a sea command.

The Right Hon. Sir Bolton Eyres Monsell, M.P., intimated in the summer his decision not to contest his seat in Parliament at the next General Election. On November 20, 1935, it was officially announced that he had been created a viscount. Sir Bolton took the title of Viscount Monsell of Evesham, in the County of Worcester.

Sir Vincent Baddeley, K.C.B., retired from the office of Deputy Secretary of the Admiralty on December 31, 1935, after 38 years in the public service, all but 1½ years of which were spent at the Admiralty. He was intimately connected with the inauguration, in 1903, of the system of examination by interview for naval cadets, afterwards copied in other branches of the public service. He was subsequently private secretary to successive First Lords.

Pay Cuts Restored.

In the Budget of 1935–36 the Government decided that the state of the national finances would permit of the full consolidated rates of full pay, unemployment pay, half-pay, retired pay and salaries being paid as from July 1, 1935. The cuts imposed in 1931 were therefore restored on that date. The decision was conveyed to the Service by Fleet Order 1199, as regards officers, and 1200, as regards naval ratings and marines, both dated May 9, 1935. The new rates also appeared in the Appendix to the Official Navy List, dated July, 1935. The consolidated rates of officers' pay are 9½ per cent. below the standard rates adopted in 1919, following an inquiry by the Jerram-Halsey Committee. The 1919 rates were paid in full until July 1, 1924, when, in accordance with the provision that 20 per cent. of the rates was to be considered as due to the high cost of living in July, 1919, and was subject to change according to the Board of Trade food prices index figures, a cut of 5½ per cent. was made. Three years later, on July 1, 1927, a further cut of ½ per cent. was made, bringing the reduction to 6 per cent. On July 1, 1930, there was another reduction of 1 per cent., bringing the total to 7 per cent. On July 1, 1931, a further 1 per cent. was taken off, bringing the total to 8 per cent. Following the financial crisis in September, 1931, which led to the change of government, all standard rates were reduced by 11 per cent., instead of the 8 per cent. then payable. This cut of 11 per cent. remained in force until July 1, 1934, when in common with all public services the reductions of 1931 were partially restored, and the rates approved for naval officers were equivalent to 10 per cent. below the standard rates of 1919. The consolidated rates, which had been approved in principle in August, 1932, to take the place of the former rates subject to fluctuation according to the cost of living, became payable in full on July 1, 1935, and as already mentioned are 9½ per cent. below the standard rates of 1919. It will be seen, therefore, that the cuts of the 1931 crisis have not been restored in full, so far as the majority of officers are concerned, as there is still a reduction of 1½ per cent. A commander, R.N., on promotion, for instance, is now entitled to £1 16*s*. 2*d*. a day, whereas before September, 1931, he received £1 16*s*. 10*d*. a day. A captain, R.N., receives £2 14*s*. 4*d*. on promotion, as compared with £2 15*s*. 2*d*. On the other hand, it is much more satisfactory to know that the pay is consolidated and permanent and not subject to the periodical changes on a basis of cost of living prices which were remote from the actual conditions of naval officers' expenditure.

CHANGES IN ALLOWANCES.

From July 1, 1935, various allowances and fees which had been reduced in 1931 again became payable in full, such as fees for marking and setting examination papers.

It was announced in October that the Admiralty were of opinion that the rates of entertaining allowance payable to captains should be independent of the rates of command money payable, and that commanders should be eligible for a rate of 5*s*. a day in certain circumstances. Formerly entertaining allowance for commanders was limited to 2*s*. 6*d*. a day. Authority was given by an Order in Council published in the *London Gazette* on October 4, 1935, for the following rates to be paid with effect from June 18, 1935 :—Captains, at 8*s*., 5*s*. or 2*s*. 6*d*. a day in conjunction with any of the rates of command money of 10*s*., 8*s*., or 5*s*., a day ; and commanders, at 5*s*. or 2*s*. 6*d*. a day in conjunction with command money of 5*s*. a day.

A fleet order dated August 15, 1935, provides that when officers in home appointments proceed on leave prior to vacating their appointments, they may be credited with duty allowances up to the termination of the appointment, although they do not rejoin for duty. The regulations concerning the cessation of allowances when officers cease duty in appointments abroad, or owing to sickness, remained as formerly.

OUTFIT AND EQUIPMENT.

From April 1, 1935, it was provided that the outfit allowance of £50 will be paid to naval officers entered as cadets on promotion to the rank or equivalent rank of acting sub-lieutenant instead of on confirmation in that rank, and to direct entry Royal Marine officers on entry instead of on promotion to probationary lieutenant. Officers will be paid the allowances by the Director of Navy Accounts as they become due, unless payment is made to parents or guardians.

From April 1, 1935, the following rates of equipment allowances became payable to officers promoted to or confirmed in the ranks stated :—Midshipman (E), on appointment to the R.N. Engineering College, Keyham, £10 for the purchase of technical books and instruments ; acting signal boatswain, on promotion £2 11*s*. 9*d*. for the purchase of a suitable telescope ; probationary lieutenant, R.M., or lieutenant, R.M., promoted from R.M. gunner, £14 19*s*. on promotion for the purchase of suitable prismatic compass, graticulated prismatic binoculars, and revolver.

LIFE INSURANCE.

On May 23, 1935, it was officially notified that the Admiralty had under consideration proposals with a view to enabling officers and men of the R.N. and R.M. to insure their lives with insurance companies of repute on terms more advantageous than they are likely to be able to obtain on their own initiative. Nothing further in regard to this scheme was announced up to the end of last year.

Attention was drawn to the fact that although naval ratings and marines on their promotion to warrant rank cease to be compulsorily insurable under the National Health Insurance Acts and the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, they remain eligible to become voluntary contributors to the scheme of health and pensions insurance, and the advantages of becoming voluntary contributors were brought to their notice in fleet orders.

ENTRY OF CADETS.

A large increase was made in 1935 in the entry of cadets from the public schools. The following figures are compiled from the lists of successful candidates issued by the Civil Service Commissioners :—

	Nov., 1933.	June, 1934.	Nov., 1934.	June, 1935.	Nov., 1935.
Cadets (Executive) . .	12	15	20	18	30
Cadets (Engineering) . .	6	5	6	6	8
Paymaster Cadets . .	10	10	11	10	10
Royal Marines . . .	5	14	10	10	14
Totals	33	44	47	44	62

It was announced by the Secretary of the Admiralty on January 8, 1936, that the age limits for the entry of special entry cadets (executive and engineering) and paymaster cadets had been raised from 17–18 to 17–18½. This change will take effect commencing with the June, 1936, examination. The age limits for entry as first appointments, Royal Marines, remain at 17½–19½.

SURPLUS LIEUTENANT-COMMANDERS.

The problem of the surplus lieutenant-commanders still remains, and even becomes more acute, despite the various retirement schemes. The December, 1935, Official Navy List showed 300 lieutenant-commanders who had passed through the promotion zone; this total compared with 268 in December, 1934, and 252 in December, 1933. In a fleet order dated March 28, 1935, a concession to officers over the zone, but who had formerly not been eligible for retired pay, was announced. The Board had had under consideration the question of extending the retired pay scale, and had decided that lieutenant-commanders who had passed out of the zone for promotion to commander and were at least 35 years of age might be permitted to retire voluntarily with retired pay, notwithstanding that they had not reached the qualifying age of 40 laid down in the regulations for retirement with retired pay. The rate for which they were made eligible was £240 a year (standard rate), subject at the time of the order to a reduction of 10 per cent. Up to December, 1935, only two officers had taken advantage of this scheme.

LOWER DECK COMMISSIONS.

Three commissions were granted in 1935 to men from the lower deck by what was known prior to 1931 as the mate scheme. One acting petty officer and two acting leading seamen were promoted to acting sub-lieutenant from September 1, 1935, and appointed for the course at Greenwich from September 26. This total showed a further decline, as in 1931 there were twelve candidates from the lower deck accepted for commissions; in 1932, eight; in 1933, six; and in 1934, five. Moreover, entries through Dartmouth College and the special entry were both increased during 1935. The number of advancements from engine-room artificer to acting sub-lieutenant (E) also fell to three in 1935.

In August, the results were published of the final examination of acting sub-lieutenants at Greenwich, which included the second group of lower deck candidates who had taken the same course and examination as cadets from Dartmouth and the public schools. This second group did not do so well as the first group (promoted in 1933 and examined in 1934). Of the six in that group, one was placed in class 1 and the other five in class 2; there were none in class 3. Of the five in the second group (promoted in 1934 and examined in 1935), none gained class 1, three were in class 2, and two in class 3.

THE NAVAL RESERVES.

A total of 1,786 officers and men of the Naval Reserves volunteered for service in the Fleet during the Naval Review period. This total omits pensioners or members of the Royal Fleet Reserve. The sum voted in the Estimates for the Royal Naval Reserve showed an increase of £9,830 on that of 1934, and for the Royal Naval Volunteer Reserve an increase of £3,640. But the Royal Fleet Reserve estimate decreased by £11,670, due mainly to smaller requirements for retainers and drill money owing to smaller numbers in class "B," 12,984 instead of 13,846.

As regards accelerated promotion for R.N.R. officers, it was announced on June 18, 1935, that no officer who is precluded from obtaining accelerated promotion, due to the fact that he has already completed his courses and training, will be passed over in seniority by any officer junior to him. During the transition period all seniority gained will be adjusted by the Admiral Commanding Reserves in order that the seniority awarded may be fair to all concerned.

In accordance with the Government decision to restore in full from July 1, 1935, the reductions imposed in 1931, on account of the financial situation, the rates of training fees for R.N.R. officers laid down in Article 190, R.N.R. Regulations (Officers) became payable in full from that date. A full restoration was also made of the cuts in R.F.R. gratuities.

In December it was announced that the railway companies concerned had agreed that the concessions in connection with railway travel would be made available for officers and ratings of the R.N.R. and R.N.V.R., but not their wives and families, in respect of leave granted during their periods of training or other service in the Royal Navy. The concession of reduced fares is obtainable only subject to the same formalities, as regards the use of Form O.1798 by officers, or production of leave ticket by men, as are applicable to R.N. personnel.

THE CHAPLAINS' BRANCH.

The Rev. Arthur D. Gilbertson, O.B.E., M.A., was appointed Chaplain of the Fleet, in succession to the Ven. Archdeacon Charles J. E. Peshall, C.B.E., D.S.O., M.A., to date December 12, 1935. Archdeacon Peshall, after more than 27 years' naval service, was appointed by the Archbishop of Canterbury to the Rectory of Great Mongeham, Kent.

Revised conditions of service were approved for chaplains entered on or after December 25, 1934. They include increased rates of full pay, but involve a reduction in the age and service scale of retired pay and in the amount of withdrawal gratuities. Chaplains already serving were given the option of retaining the old conditions if they preferred. The lowest scale of pay, 15*s.* 4*d.* a day, was abolished. The scale of 18*s.* a day, formerly payable after three years, was made the new rate on entry ; 23*s.* 4*d.* a day, payable after six years, became the rate after three years ; and so on until the later maximum of 45*s.* a day was attainable after 27 years instead of 30 years. A new maximum rate of 47*s.* 8*d.* a day was introduced for chaplains over 30 years' service. An Order in Council published in the *London Gazette* on October 8, 1935, extended the new conditions to ministers of religious bodies not in conformity with the Church of England who were rendering whole-time service as temporary chaplains, R.N.

NURSING SERVICE CONDITIONS.

In common with the nursing services of the Army and Air Force, a change was made in the organisation and conditions of service of the members of Queen Alexandra's R.N. Nursing Service, with effect from August 1, 1935. The titles of head sister-in-chief and head sister were altered to matron-in-chief and matron respectively. A new rank of senior sister was introduced for which nursing sisters not promoted to superintending sister will be eligible for appointment in vacancies in the establishment after 20 years' service. The ages for compulsory retirement will be 55 years for nursing sisters, senior sisters and superintending sisters, 57 for matrons, and 57, or after three years in the rank, whichever is earlier, for matrons-in-chief. Members will be allowed to retire voluntarily at or after the age of 50. The rates of pay have been improved. Charge pay is allowed in certain appointments at Hong Kong, Shotley and Dartmouth. Board and washing allowances are raised. Retired pay and gratuities are also improved.

RECRUITING.

It is satisfactory to know that the eagerness of British youth to join the Navy shows no sign of abatement. In the six months ended June 30, 1935, the number of applications to enter the R.N. and R.M. was 25,459. The number accepted was 3,726. The large number of rejections was not on account of medical unfitness, but because no more were required. In a lecture at the Royal United Service Institution on October 31, 1935, Rear-Admiral J. F. Somerville, Director of Personal Services, quoted the recruiting figures of the previous year: 51,777 boys and youths applied to enter, of whom only 6,814 could be accepted. Rear-Admiral Somerville also stated that of the men who completed 12 years' service 64 per cent. re-engaged for a further ten years.

NAVY WEEK.

Navy Week, 1935, was a greater success than ever before. As a sign of the renewed interest in the Fleet, this was most gratifying. The Jubilee Naval Review three weeks earlier no doubt helped in the result. The Admiralty, however, gave all possible encouragement. The Director of Personal Services, Rear-Admiral J. F. Somerville, took a direct and personal interest in the plans. For the first time, an officer was appointed within the Admiralty, Commander G. A. B. Hills, R.N., to act as Liaison Officer with the Press, and the posts of the Navy Week Secretaries at the three home ports were placed upon a permanent basis.

CIVIL EMPLOYMENT.

Good work continues to be done by the R.N. and R.M. Officers' Civil Employment Committee at the Admiralty, under the chairmanship of Admiral Sir Aubrey Smith. In its fourth annual report published in October, 1935, the Committee was able to announce that 133 appointments for officers were obtained during the year ending July 31, 1935, as compared with 103 in 1933–34. The Committee is provided with an office in the Admiralty (Room 12, south block), where the Liaison Officers are always glad to assist or advise officers who have retired or are about to retire to find suitable employment in civil life. No fees are charged. The officers placed in employment in 1934–35 included 13 captains, 28 commanders, 43 lieutenant-commanders, 5 lieutenants, 1 sub-lieutenant, 2 midshipmen, 22 engineer officers, 14 accountant officers, 2 shipwright lieutenants, and 3 warrant officers. The Committee states that it has become abundantly clear to all concerned in its work that it is essential for any retired officer who wishes to secure a reasonably well-paid post to be equipped with commercial knowledge apart from his naval qualifications. Every effort is made to impress this fact on officers who register, and they are recommended to undergo an intensive business course. Sir Isaac Pitman and Sons offer special terms for such a course to officers nominated through the Committee.

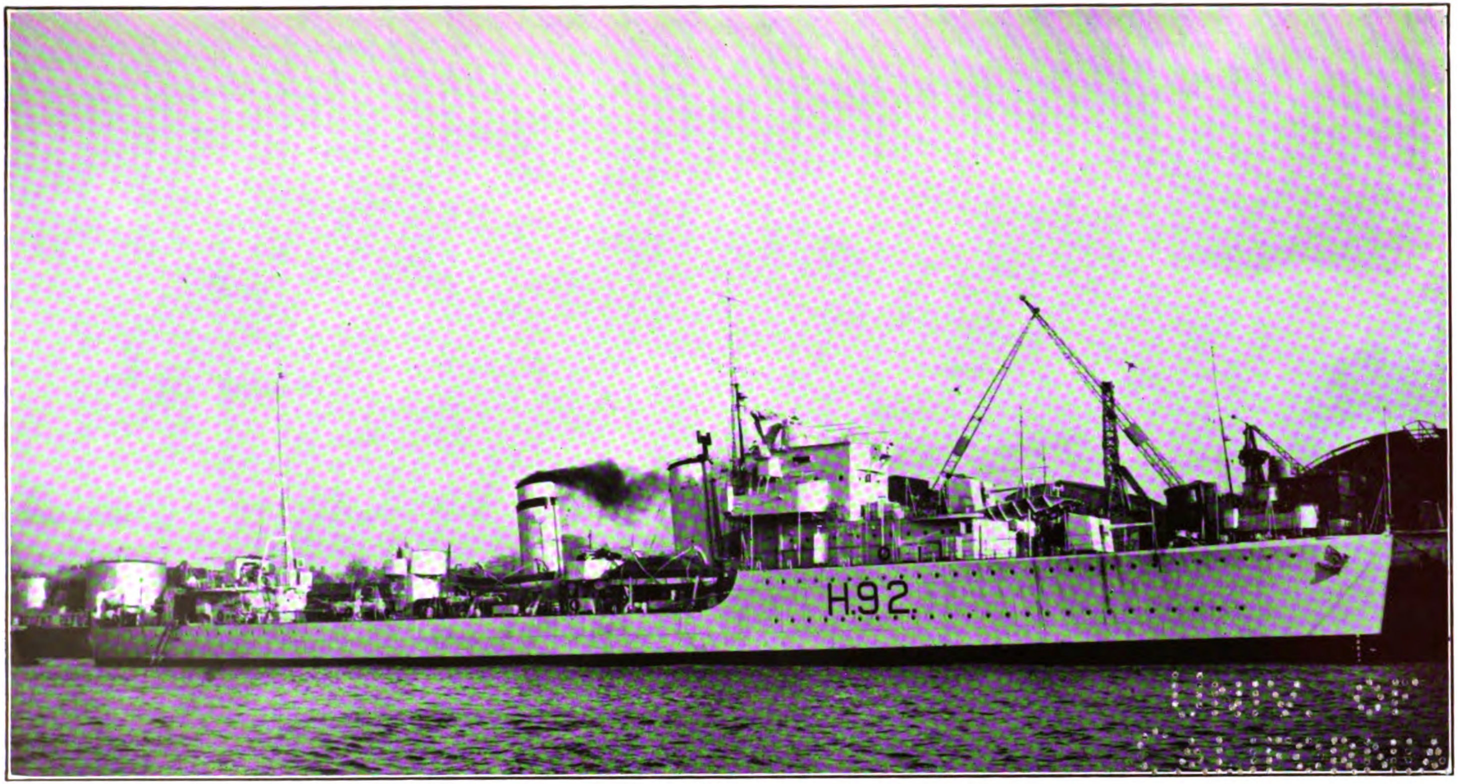
As regards the employment of men after discharge, it has been brought to the notice of their Lordships that doubts are frequently expressed whether men who have completed their time for pension are as likely to obtain civil employment as those who leave the service on expiration of their first engagement. It was announced in October that statistics which had been obtained from the National Association for Employment of Regular Sailors, Soldiers and Airmen show that these doubts are unfounded. The percentage of pensioners registered who obtain employment is slightly higher than that of first period men who have registered under the Association.

An addition to the forms of employment in civil life was made in 1935 by the decision to employ a limited number of writer ratings in H.M. Coastguard. The duties required are primarily clerical, but writers, after instruction, are required to reach the same standard of efficiency as auxiliary watchers in the Coast Life-Saving Corps, and to keep watch periodically. They are rated as Coastguardsmen, but are not regarded as eligible for promotion to the rank of station officer.

Canteens and Welfare.

The unexpected changes in the distribution of the Fleet from the end of August, 1935, and the concentration of so many ships in the Eastern Mediterranean, naturally had a great influence on the maintenance of food and canteen supplies. In a report to the Headquarters Canteen Committee, Paymaster-Commander W. E. H. Jolly, Manager of the Naval Canteen Service, stated that the only report of inadequate supplies which had reached him was from one section of the Home Fleet which was detached at very short notice for service abroad. These ships were small ones, and it took a little time to regularise a system of supplies. It was necessary to draft N.A.A.F.I. staff from home to depots abroad in order to supervise supplies, and in consequence the staff of the Naval Canteen Service at home had to be proportionately increased. It was announced in August, 1935, that the sum of £5,135 was available for distribution in respect of surplus revenue accruing to the N.A.A.F.I from naval canteen trading during the year ended November 3, 1934. As in previous years, 40 per cent. of this amount (£2,054) was allocated to the R.N. Benevolent Trust, £300 to the Union Jack Club, and the remainder divided among the naval commands to be distributed for the improvement of recreational facilities.

In September last their Lordships appointed Rear-Admiral Dudley B. N. North, C.B., C.S.I., C.M.G., C.V.O., A.D.C., Rear-Admiral Commanding H.M. Yachts, to be President of the R.N.



H.M. DESTROYER GLOWWORM.

Commissioned for Service, January 22, 1936.

(By courtesy of the builders, John I. Thornycroft and Co., Ltd.)

Benevolent Trust, in succession to Admiral the Hon. Sir Herbert Meade-Fetherstonhaugh, G.C.V.O., C.B., D.S.O., from August 31, 1935.

In the same month, in the interests of naval ratings and their families, their Lordships decided to establish in the R.N. Barracks, at each of the three home ports, a Welfare and Marriage Allowance Section. The valuable work already being done by local unofficial organisations, supported by depot aid funds, etc., was referred to, and their Lordships expressed the hope that by this establishment of Welfare Sections on an official basis an even greater measure of assistance could be afforded to ratings, wherever they might be serving, or to their wives and families in any domestic troubles which might arise. The staff of the new Welfare Sections includes the following ladies, who took up their new duties on October 1, 1935:—Portsmouth, Mrs. E. M. Langdon, Admiralty Inspector (Children's Welfare); Devonport, Mrs. Sprott, Depot Air Fund Lady Worker; and Chatham, Miss H. Wyon, Deaconess.

WEEKLY PENSIONS.

On July 18, 1935, the Admiralty notified that they had decided to introduce a system of weekly payment in advance of naval pensions in gradual substitution for the former system of quarterly payment in advance. An Order in Council giving effect to this decision appeared in the *London Gazette* on October 4, 1935. The new system began to take gradual effect on January 1, 1936. It affects only naval ratings and other ranks in the Royal Marines. The Order in Council authorised the increase, when computing naval pensions for payment on a weekly basis, of any fraction of a penny in the total weekly rate, as assessable under the regulations, to a penny.

SOUND FILMS AFLOAT.

A notable addition to the amenities of life afloat was announced in September, 1935. An organisation for the supply of sound equipment and films has been set up, the Admiralty Cinema Fund, under the supervision of the Director of Physical Training and Sports. A scheme for the purpose had been prepared in 1931, but for various reasons it was not found possible to proceed with it. One obstacle was the lack of a capital sum from which the purchase of equipment could be financed. Now, however, the allocation of certain trust moneys in the possession of the Admiralty has overcome this handicap and enabled supply to be organised on a sound financial basis. Arrangements have been made with Gaumont-British Equipments, Ltd., to supply 35 mm. standard sound film equipment to Admiralty specification suitable for use in any ship of the size of a destroyer and upwards. Equipment is hired to units desiring it, but remains the property of the Admiralty Cinema Fund. For the hire of films, a contract has been made under which the charges are appreciably lower than those which would be charged by an ordinary commercial organisation. Films are only allowed to be exhibited to naval personnel, though casual visitors to ships are not debarred from attending cinema performances. Lieut.-Commander J. L. F. Hunt, R.N., retired, of 184, Wardour Street, has been appointed Admiralty Film Distributor under this scheme.

Sport and Recreation.

The excellent work which is done by the R.N. and R.M. Sports Control Board at Craven House, Northumberland Avenue, may be better appreciated by recalling the lack of facilities of the kind for the Navy as a whole before the War. Some of the leading games, such as cricket, had their clubs within the Service, but there was no provision, as now, for organised events in all sports, nor for the encouragement of recreation—both indoor and outdoor—amongst the personnel, not only for the selected few, but for the masses. Starting with no assets in 1920, the Board has built up an accumulated fund, from canteen profits, cinema film rights, and donations, of over £66,500. It has disbursed for recreation, as free grants, £29,750, and as loans without interest, £34,310. Further details of the work of the Board, and records of the R.N. and R.M. teams in the various pastimes, will be found in the R.N. and R.M. Sports Handbook, issued by the Board in December each year.

II.—DOMINION NAVIES.

The Royal Australian Navy.

The Estimates for the Australian Navy in 1935–36 amounted to £1,886,746, as compared with £1,603,583 for the previous year. Provision was made for an increase in the personnel from 3,250 to 4,100, the increase including 38 officers.

The cruiser Sydney, originally begun as the Phaeton under the Imperial Government's 1932 construction programme, and subsequently taken over by the Commonwealth Government, was completed in September, 1935, and on October 1 officers and men of her ship's company, under Captain J. U. P. FitzGerald, R.N., were received by the Lord Mayor of London at Guildhall and entertained to luncheon by the Corporation. On November 1, 1935, the Admiralty announced that the Commonwealth Government had offered to place the Sydney at the disposal of the Government in the United Kingdom. This offer was accepted, and the Sydney temporarily relieved the Achilles in the Second Cruiser Squadron, Home Fleet, at Gibraltar.

Two sloops of the " Grimsby " type have been provided for, the Yarra, laid down in 1934 and completed in 1935 ; and the Swan, laid down in 1935, both at Cockatoo Island, Sydney.

In the course of a review of Commonwealth defence measures on December 1, 1935, Mr. Robert A. Parkhill, M.P., Minister for Defence, said that a squadron of twelve aircraft was proposed for seaplane-carrying cruisers, three squadrons for co-operation with the

Army, and two (ultimately three) squadrons of multi-engined land machines for coastal reconnaissance. Mr. Parkhill said that while British naval strength was Australia's initial safeguard, Australia was 10,000 miles from the main fleet concentration, and she had to safeguard her external right to seaborne trade and her internal rights to territorial integrity and the continuance of her national activities.

The Admiralty announced that, with the concurrence of the Australian Government, the appointment had been approved of Rear-Admiral Richard H. O. Lane-Poole, O.B.E., to be Rear-Admiral Commanding H.M. Australian Squadron, in succession to Rear-Admiral W. T. R. Ford, C.B., to date about April, 1936.

THE ROYAL CANADIAN NAVY.

The Royal Canadian Navy is being maintained on similar lines to previous years. No new vessels have been built since the destroyers Saguenay and Skeena in 1929–31.

In the spring of 1935 the destroyers from Esquimalt and Halifax joined up for a training cruise and exercises at Bermuda and in the West Indies. Commander R. I. Agnew, R.C.N., commanding the Eastern Sub-Division in the Saguenay, was appointed Acting Captain (D.), Canadian Division, from the date the Western Sub-Division joined the Eastern Sub-Division early in February until the day after the former parted company in April. This was the first appointment of the kind.

Admiral Sir Charles Kingsmill, who is generally regarded as the father of the Royal Canadian Navy, and was the original Director of the Naval Service of Canada, from 1908 to 1920, died at Ottawa on July 15, 1935, at the age of eighty.

NEW ZEALAND DIVISION, ROYAL NAVY.

The Prime Minister of New Zealand, Mr. Forbes, announced on October 16, 1935, that the cruiser Diomede, Captain C. M. Graham, R.N., had been detailed for service under the British Admiralty at the request of the British Government. He trusted that the departure of the vessel as a purely temporary measure would not give rise to mischievous rumours as to the Dominion being likely to be involved in war. The Diomede arrived at Singapore on October 31, Colombo on November 4, and Aden on November 11.

In November, H.M.S. Achilles returned to Chatham from Gibraltar to pay off and prepare for service as flagship of the New Zealand Division in place of the Dunedin. A list of the officers required for service in her on loan to the New Zealand Government for three years was published in fleet orders on January 16, 1936. They included officers qualified as air pilot and air observer. Hitherto the New Zealand Division had not included any shipborne aircraft.

SOUTH AFRICAN NAVAL SERVICE.

The South African Naval Service does not now include any permanent force, the seagoing units having been disposed of on March 31, 1934 (see the 1935 edition of the " Annual," page 25). The Royal Naval Volunteer Reserve (South African Division) is still flourishing, however, and its training is carried out by the vessels of the Royal Navy on the Africa Station.

It was announced in July, 1935, by the Admiralty that when officers of the R.N.V.R. (S.A. Division) are appointed for training to H.M. ships and establishments other than on the Africa Station they are to be entered separately for pay and victualling at the following rates in South African currency :—Captain, £1 10*s.* per diem ; commander, £1 ; lieutenant-commander, 15*s.* ; lieutenant, 12*s.* 6*d.* ; sub-lieutenant, 10*s.* ; warrant officer, 10*s.* ; and midshipman, 6*s.* They will also be granted free victualling and 2*s.* a day messing allowance when embarked for training.

ROYAL INDIAN NAVY.

The sloop Indus, Commander E. M. Bayfield, R.I.N., was completed by Messrs. Hawthorn Leslie and Co. at Hebburn-on-Tyne in the early spring of 1935, and joined up with the First Minesweeping Flotilla of the Royal Navy temporarily. She was present at the Jubilee Naval Review in July, and left at the end of that month, arriving at Bombay on September 1, where she was escorted into harbour by other vessels of the Indian Navy, and saluted the flag of Rear-Admiral A. E. F. Bedford, C.B., Flag Officer Commanding, in the Clive.

On the occasion of the King's Birthday, June 3, 1935, the India Office announced that his Majesty had been pleased to signify his intention of presenting a King's Colour to the Royal Indian Navy, of a design identical with that approved for the Royal Navy in 1924, and subsequently also approved for the Navies of the Dominions and for the New Zealand Division of the Royal Navy.

III.—THE YEAR'S EVENTS.

When the U.S. gunboat Fulton took fire in Bias Bay during a heavy storm on March 14, 1935, the vessels which answered her call for assistance included H.M.S. Wishart, Commander Percy Todd. By placing his ship alongside the bows of the Fulton, despite the heavy swell, Commander Todd enabled 139 of the crew of 187 of the American vessel to be rescued. The remainder were saved by the s.s. Tsinan. On February 21, 1936, it was announced that the President of the United States had been pleased to make awards to Commander Todd, Lieutenant-Commander D. B. Wyburd, R.N., Lieutenants A. C. Macdonald and W. Whitworth, R.N., and Able Seamen A. E. Clarke and G. T. Jeffrey, all of H.M.S. Wishart. Certain awards were also made to officers of the Tsinan, through the Board of Trade.

The foregoing was typical of many occasions during the year in which British ships answered calls for assistance. On one occasion of the kind a number of naval cadets in their first voyage took part. On January 21, 1935, the oil tanker Valverda, of Glasgow, took fire 1,200 miles east of the Bahamas, and became unmanageable. The cadets' training cruiser Frobisher, Captain P. K. Kekewich, went to her assistance, and took her in tow, assisted by the Guardian, Captain K. H. L. Mackenzie. The Valverda was towed for a distance of 880 miles to Bermuda, the passage occupying seven days. The salvage money awarded for this service was the largest for some time. Details appeared in fleet orders dated February 6, 1936.

Except that the Home Fleet summer cruise was modified on account of the Jubilee Naval Review, and that the Mediterranean Fleet returned home to take part in the latter, the fleets and squadrons carried out their normal cruising programmes up to the end of August. The precautionary measures then decided upon owing to the Italo-Abyssinian War led to the abandonment of the normal programmes.

On September 20, 1935, the British Ambassador in Rome called on Signor Suvich, Under-Secretary for Foreign Affairs, in order to communicate details of certain movements of the British Fleet in the Mediterranean and reinforcements of men and material of the British garrisons there. He added that they were not intended to imply any aggressive intention on the part of H.M. Government. He explained that such measures had been taken as a natural consequence of the impression created by the violence of the campaign against the United Kingdom which had been conducted by the Italian Press during previous weeks. Signor Suvich made an analogous communication and stated that he was authorised to declare to the Ambassador that Italian military preparations in the Mediterranean Basin were of a purely precautionary nature and had no aggressive aims.

The Mediterranean Fleet was moved from Malta to Alexandria, which was to have been visited by the Fleet in the course of its summer cruise, arranged some time before. Admiral Sir William Fisher, who was to have relinquished command about the end of October, remained as Commander-in-Chief. His successor-designate, Admiral Sir Dudley Pound, arrived at Alexandria on October 10, and took up the duties of Chief of Staff to the Commander-in-Chief, succeeding Rear-Admiral R. H. T. Raikes, who hoisted his flag in H.M.S. Resource, repair ship, as Rear-Admiral at Alexandria. Rear-Admiral G. F. B. Edward-Collins, who was to have become Chief of Staff, Mediterranean Fleet, became Chief Staff Officer to Rear-Admiral Raikes. Rear-Admiral the Hon. Sir Alexander Ramsay, who was to have been relieved in command of Aircraft Carriers on August 29 by Rear-Admiral Noel F. Laurence, retained the command for a further six months. The Courageous, his flagship, arrived at Alexandria on September 7.

Reinforcements were provided from other stations. From the Home Fleet, the 2nd and 5th Destroyer Flotillas, 2nd Submarine Flotilla, 1st Minesweeping Flotilla and Minesweeping Training

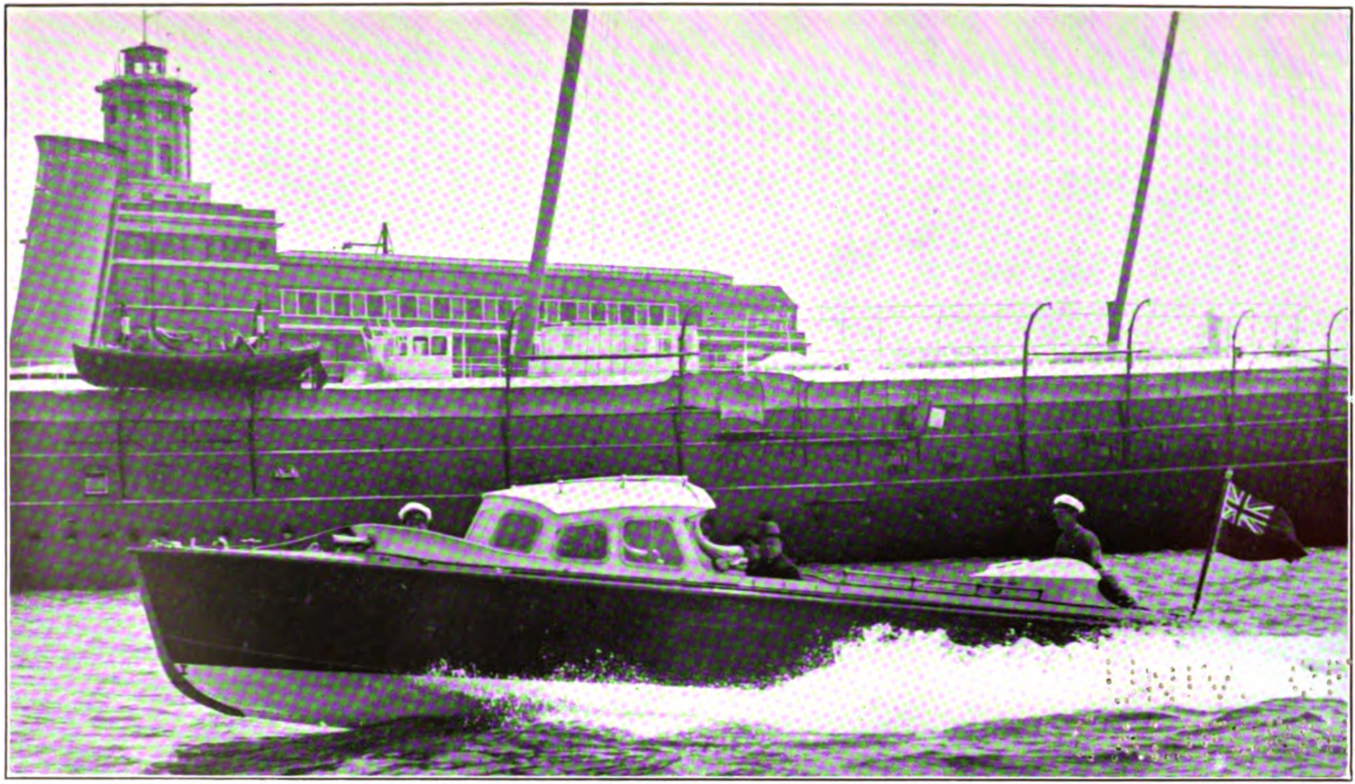
Flotilla proceeded to the Eastern Mediteranean. The Battle-Cruiser Squadron, 2nd Cruiser Squadron and 6th Destroyer Flotilla proceeded to Gibraltar. Two new flotillas of destroyers, the 20th and 21st, were organised from reserve units for duty with that portion of the Home Fleet remaining in home waters. The South American Division (cruisers Exeter and Ajax) joined the Fleet in the Eastern Mediterranean, and Commodore Evans, on his promotion to flag rank in October, became Rear-Admiral, Second-in-Command, First Cruiser Squadron, with his flag in the Exeter. From the China Station, the cruiser Berwick and minelayer Adventure were moved into the Mediterranean, certain destroyers to Aden, and other ships to Singapore. The East Indies Squadron was also based on Aden temporarily, and was joined there by the cruiser Diomede from New Zealand. In November, destroyers of the 2nd Flotilla, Home Fleet, which had been on duty in the Red Sea, went to Bombay to refit.

There were a number of officers under the command of Vice-Admiral H. J. S. Brownrigg and Brigadier W. L. H. Tripp, Royal Marines, appointed for duty in connection with the Base Defences, Mediterranean Station (officially known as H.M.S. President IV). On January 12, 1936, Rear-Admiral Ralph Leatham succeeded Vice-Admiral Brownrigg on this duty.

In January the customary spring cruise of the Home Fleet to Spain and Gibraltar enabled ships which had been at Gibraltar for four months to come home for leave to be given to their crews.

MISHAPS.

The battle-cruisers Hood and Renown collided off the coast of Spain on January 23, 1935. Courts-martial were held at Portsmouth on February 26, 27, and 28, at which Rear-Admiral S. R. Bailey, Commanding the Battle Cruiser Squadron, was acquitted of a charge of negligence or default in hazarding the two ships; Captain H. R. Sawbridge, of the Renown, was found guilty of hazarding his ship and sentenced to be dismissed his ship; and Captain F. T. B. Tower, of the Hood, was acquitted of a charge of hazarding his ship. On March 19, a revision of the proceedings of the Courts-martial was announced. The Board of Admiralty dissented from the finding in regard to Rear-Admiral Bailey to the following extent. Rear-Admiral Bailey adopted an unusual procedure in directing the Hood and Renown to steer definite courses to close. Since he had given that order, responsibility for the manœuvre rested on him, and it was incumbent on him at the proper moment to make a further signal to re-form his squadron. His not doing so left in doubt his final intention. The signal for the Hood and Renown to form single line ahead was made too late. For these reasons their Lordships were unable to absolve Rear-Admiral Bailey from all blame. They agreed with the finding in regard to Captain Sawbridge, but reduced the sentence to a severe reprimand and he resumed command of the Renown. They considered that Captain Tower should have taken avoiding action earlier and to that extent they were unable to acquit him of all blame.



[Photo by Cribb, Southsea.

ONE OF THE NEW HIGH-SPEED MOTOR BOATS.

Introduced into the Service, 1935.

The sloop Hastings, Captain the Hon. C. P. Hermon-Hodge, D.S.C., grounded on June 11, 1935, on Shabkutb Reef, off Suakin, while on passage to Port Sudan owing to the presence on board of a suspected rabid cat. The sloop lay on a rocky bottom, several compartments were flooded, and it was not until mid-September that she was refloated. On November 13, a Court-martial at Devonport found Lieutenant M. F. Andrew, the navigating officer, guilty on charges of negligently stranding and hazarding the ship, and he was reprimanded. Next day a Court-martial found Captain Hermon-Hodge guilty on similar charges, and he also was reprimanded.

Some disquiet was aroused by cases of sabotage during the winter of 1935–36. On December 9, it was reported that the refitting of the battleship Royal Oak at Devonport had been delayed by deliberate interference with the electric supply. Damage to the electric motors of the submarine Oberon was also shown at a court of inquiry to have been caused deliberately. On February 16, 1936, a further case of sabotage was revealed at Chatham on board the cruiser Cumberland, and subsequently one in the destroyer Velox, in which depth-charge apparatus was alleged to have been tampered with.

THE NAVY IN LONDON.

On February 18, 1936, the Royal Navy was in evidence in London for the first time in the new reign when King Edward, at his first Investiture, presented the Royal Victorian Order and medals to the officers and men of the naval guns' crews of H.M.S. Pembroke, Chatham, and H.M.S. Excellent, Portsmouth, who drew the gun-carriages at his father's funeral. Captain A. L. St. G. Lyster, D.S.O., R.N., of H.M.S. Pembroke, and Captain A. J. Power, R.N., of H.M.S. Excellent, were invested as Commanders of the Royal Victorian Order. Commanders J. J. Weld and John Terry, R.N., with three Lieutenant-Commanders, R.N., and three Lieutenants, R.N., were made Members of the 4th Class of the Order; and two Gunners, R.N., Members of the 5th Class of the Order.

CHAS. N. ROBINSON,
Commander, R.N.

CHAPTER II.

FOREIGN NAVIES.

A REVIEW of the navies of foreign Powers is more vital to the British people to-day than it has been since the period which immediately preceded the Great War. Not only are the restrictions of the Washington Treaty, and, to us, the far more perilous prohibitions of the London Treaty about to lapse, when we shall be free once more to build according to our needs, but Italy's challenge to the League of Nations has shown up in high relief our responsibilities and our weakness. Anyone who studies the present international situation must be forced to realise that the strength of our Navy is not only the basis of our own security, but also is now a dominant factor in preserving world peace. The British fleet in the Eastern Mediterranean, more than anything else, has prevented the war between Italy and Abyssinia from spreading into a general conflagration. Yet that fleet has only been brought up to the standard of strength which circumstances have made necessary by drawing on the Home, China, America and West Indies stations, and even on the Australian and New Zealand naval forces. A comparatively superficial survey of foreign navies cannot fail to demonstrate the fact that the effort required to restrain even a second class naval Power has necessitated denuding our home and overseas squadrons to an extent which would make it extremely difficult for us to safeguard our ocean shipping if trouble should arise elsewhere.

Such is the position which high diplomacy and idealistic gestures have brought about. Theoretically, the Treaties should have stabilised the navies of the world ; in practice, navies which have been less affected by their terms than our own have been growing year by year until they now constitute a grave danger to British interests. In fact, the strength of our fleet is so reduced that, when it is put to the test, it is found to have no safe margin over a second class standard.

As regards material developments, it will be noted that France, Italy, and Germany between them have in hand eight battleships, all of which will outclass, in some respect or another, anything we possess or can even lay down before 1937. The London Treaty restricts our cruiser strength not only in numbers but in the fighting efficiency of individual units *vis à vis* foreign designs. The ever growing flotillas of submarines built or building for foreign Powers make the deficiencies in our destroyer strength more and more alarming.

TABLE "A."—WARSHIPS COMPLETED, BUILDING, AND APPROPRIATED FOR DURING 1935.

NAVY.	Capital Ships.	Cruisers (Category A).	Cruisers (Category B).	Aircraft carriers.	Flotilla leaders.	Destroyers.	Submarines.	Sloops.	Torpedo-boats, C.M.Bs., or Patrol Craft.	Gunboats.	Minesweepers.	Netlayers.
British Empire .	..	..	12	1	4	31	12	19	6*	..	..	1
United States . .	..	3	9	3	13	46	16	..	..	2	..	..
Japan	..	..	7[1]	2	..	16	10	..	16	..	..	..
France	3	..	6	..	8[2]	15	15	1	..	..	4	..
Italy	2	..	6	..	..	4	18	1	7[3]	4	..	..
Germany . . .	3	..	3	..	..	16	28	..	..	1	..	..
Denmark . . .	..	..	..	..	..	..	..	1	2	..	..	..
Estonia . . .	..	..	..	..	..	..	2	..	..	..	..	..
Netherlands . .	..	..	2	..	..	..	2	..	..	..	4	.
Norway . . .	..	..	..	..	..	..	..	..	2	..	..	..
Poland	..	..	..	..	2	..	3	1[4]	..	..	4	..
Portugal . . .	..	..	2[5]	1[5]	..	4[5]	8[5]	9[5]	..	4[5]	..	..
Spain	..	2	..	..	..	..	3	4[4]	..	..	..	..
Sweden . . .	..	..	..	..	..	2	4	..	..	..	..	..
Argentina . . .	..	..	1[6]	1[5]	1[5]	..	3[5]	..	..	..	5	..
Brazil	..	..	2[5]	..	..	9[5]	6[5]	..	..	..	6[5]	..
Mexico . . .	..	..	..	..	..	..	..	4	..	10	..	..
Uruguay . . .	..	..	..	..	..	..	..	..	3[7]	..	..	..
Persia	..	..	..	..	..	..	..	..	3[7]	..	..	..
Siam	..	..	..	..	..	..	6[8]	2[8]	26[8]	2[8]	2[8]	..
Total, exclusive of British Empire	8	5	38	7	24	112	118	21	36	21	25	..

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* Coastal motor boats.

[1] Includes one cruiser minelayer.

[2] These are vessels of nearly 2,500 tons and would be in the cruiser category of Powers who ratified the London Treaty.

[3] Six torpedo boats of 615 tons and one C.M.B.

[4] Minelayer of 2,000 tons.

[5] Part of a ten-year programme for which it is reported provision has been made, but not all these ships have been laid down.

[6] Training cruiser.

[7] Patrol vessels.

[8] Part of a six-year programme, but not all these vessels have been laid down.

In view of the recurring advocacy of the use of coal in some shape or form in British warships, and the mis-statements which have been published regarding the retention by foreign Powers of dual firing, it is as well to place on record the answer given by the First Lord of the Admiralty to a question on the subject in the House of Commons. He said: " Two countries only have fitted the dual-firing system in recent years—France in three vessels of the Suffren class completed in 1931, and Japan in four cruisers completed in 1926 and 1927. The amount of coal consumed in these ships is not known, but coal can only be burnt in a small proportion of the boilers, and is rarely used. Dual firing is not being fitted in new constructions by foreign Powers, and dual-fired vessels are generally being converted on reconstruction to burn oil only. It can therefore be assumed that the dual-firing system does not commend itself to foreign Powers."

UNITED STATES.

The Naval Appropriations Bill for 1935–36 signed by the President on June 25, 1935, amounted to $458,684,379. This is a record figure for peace time, and an increase of over 30 per cent. on the previous years. The sum allotted to new construction is $100,000,000; this includes the following new ships: two light cruisers—to replace the Omaha and the Milwaukee; one aircraft carrier to replace the Langley; three leaders; twelve destroyers; six submarines and 555 aircraft. According to a statement by Mr. H. L. Roosevelt, Assistant Secretary of the Navy, the U.S. fleet is operating 321 ships and 920 aircraft, as compared with 306 ships and 760 aircraft during the last fiscal year.

The Secretary of the Navy, Mr. Swanson, has announced that the 1936–37 building programme will include twelve 1,500-ton destroyers; six submarines, and possibly a battleship. He called attention to the beneficial effect on unemployment of an orderly, systematic building programme. " Not only," he remarked, " are the coastal shipyards directly benefiting, but industries diffused throughout the nation are assisted by our revival in naval building. It is estimated that 80 per cent. of the funds appropriated for the purchase of naval vessels and aircraft go directly into the pockets of the labourers who handle the material. . . ."

Up to date, the activities of the Navy Department have been directed towards bringing the fleet up to Treaty strength. But if Japan should endeavour to give effect to her claim for parity, it will inevitably result in a still greater shipbuilding programme, and, probably, a more forward policy in the Pacific, by the United States.

BATTLESHIPS.

The London Treaty precludes any new capital ship being laid down before January 1, 1937. Under the Washington Treaty new capital ships could be commenced not more than three years before the ships they are to replace become over age. Three battleships, the Arkansas, Texas and New York, are already over age; the Oklahoma, Nevada, Pennsylvania, and Arizona become over age in 1936. The United States will thus be entitled to lay down seven replacement ships in 1937. Moreover three more ships become over age within the next three years, and provision might, therefore, be made to replace these also in that year. Nevertheless, it is understood that, quite apart from the question of finance, the Navy Department would prefer to limit initial construction to a single experimental ship; but here again, probably, much will depend on what is done by other Powers, especially Japan.

The ten existing battleships have all been modernised, the vessels undergoing more and more elaborate treatment as each was taken in hand. The five newest ships of the West Virginia and Tennessee classes have not been modernised; except for the aircraft carriers, they are now the only ships left with turbo-electric machinery.

CRUISERS.

The last three 8-in. cruisers allowed under the Washington Treaty are in hand. The Quincy was launched on June 19, 1935, and was originally due for completion in January, 1936. Progress was somewhat delayed by a fire which broke out on board on August 7, last, causing damage to the electrical equipment. This was replaced by gear from the sister ship Vincennes building in the same yard. The completion date for the latter was January, 1937, and for the Wichita, January, 1938.

Seven 10,000 ton 6-in. cruisers are in various stages of construction and are all due for completion between April and December, 1937. Labour trouble in the yard of the New York Shipbuilding Company is delaying completion of the Savannah, Nashville, and Phœnix. These will all have an armament of fifteen 6-in. guns like the Japanese Mogami class, but they will doubtless be better protected than the latter since they displace 1,500 more tons. The two 6-in. cruisers of the 1935–36 Programme are being built, the St. Louis by the Newport News Shipbuilding and Dry Dock Company, and the Helena by the New York Navy yard. Unless the seven earlier ships are less than the reputed 10,000 tons, these two cruisers cannot be more than 8,550 tons if they are to be within the Treaty limits.

AIRCRAFT CARRIERS.

Work on the aircraft carriers Yorktown and Enterprise is proceeding rather slowly and they will be some months behind the original date of completion. The date for the former is now March, 1937, and for the latter, July of that year. Welding is being used extensively in their construction. The projected aircraft carrier of the 1935–36 Programme will, it is understood, be a vessel of only 14,700 tons instead of the 20,000 tons of her immediate predecessors.

The Ranger, of 14,500 tons, completed in 1934, has given a good deal of trouble, and after her shake-down cruise had to undergo a long refit. One of her defects was due to corrosion in the petrol storage tanks. According to a Press report, in order to economise weight and expense one side of the tanks was formed by the side of the ship, and it is this plating which has deteriorated. The ship, which has now rejoined the fleet, is capable of carrying 79 aircraft (see "Foreign Fleet Air Arms"). Stowage for this large number is made possible by the provision of arrangements for tricing a number of them up to the roof of the hangar—the under side of the flying deck. In February of 1936 the Ranger went to the Alaska area to carry out cold weather tests and exercises.

Destroyers and Leaders.

The six destroyers of the Farragut class have been completed. The fore part of the hull of these craft is completely welded as far aft as the bridge. Abaft that station, some of the principal longitudinal seams are riveted. The transverse bulkheads are welded. There are two large (13,500 equivalent h.p. each) and two small (6,500 h.p.) boilers, with steam pressure of 400 lbs. per sq. in., superheat 150° F. The engines are of the normal H.P. and L.P. turbine type. The two foremost 5-in. 38 calibre guns are fitted with spray shields, but these are omitted in the other three mountings which enables them to be given increased elevation for use against aircraft.

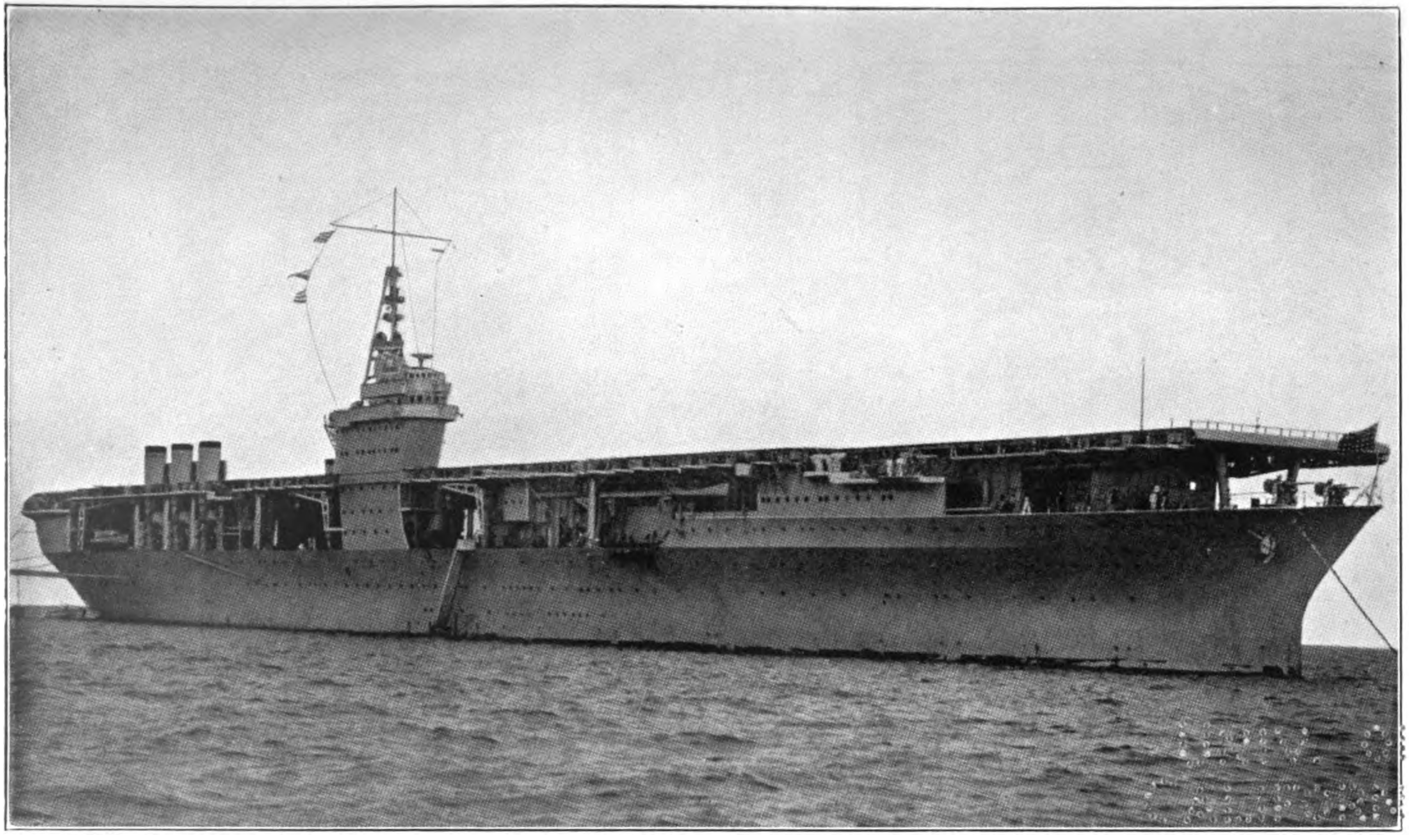
The sixteen destroyers of the Mahan class (1934 Programme) are similar in general design, but the boilers vary and the hulls are even more modern in construction; the plating is of semi-mild galvanised steel and the lower edge of each plate is joggled inwards to lap the top edge of the plate below, the outboard groove and the inboard seam being filled with weld metal. The panels and deck houses are of stainless steel.

Twelve more 1,500-ton destroyers of the 1934–35 Programme are due for completion during 1936–37. As already mentioned, the 1935–36 Programme makes provision for yet another twelve destroyers.

The thirteen 1,850-ton flotilla leaders, contemporaries of the new destroyers, are to be armed with eight 5-in. guns in four twin turrets and two quadruple torpedo tubes. The gun armament is heavier than that carried by any ships of this class built or building for any other Power; but that does not necessarily mean that it would prove to be the most efficient. Experience has shown the difficulty of serving guns of unduly heavy calibre in light craft in a sea-way, and twin mountings have their disadvantages.

Submarines.

The submarines Shark and Tarpon laid down in 1933 are completed; and the slightly smaller Porpoise and Pike of the same year have both joined the fleet. The six craft of the Plunger class, laid down early in 1935, are due for completion in 1937. The six



[U.S. Navy Official Photograph.

THE U.S. AIRCRAFT CARRIER RANGER.

Completed, 1935; *Carries* 75 *Aircraft.*

submarines of the 1935–36 Programme will be named Salmon, Seal, Skipjack, Snapper, Stingray, Sturgeon.

Two gunboats, or sloops, the Erie and Charleston, of 2,000 tons are due for completion in the spring of 1936.

NAVAL AIR SERVICE.

The last of the great dirigibles built for the U.S. Navy, the Macon, was lost at sea on February 12, 1935, off the coast of California. There were only two deaths, the remaining 81 members of the crew being rescued by cruisers in the vicinity after they had taken to the rubber life-boats. Owing apparently to some failure in the structure, there was a sudden deflation of some of the gas cells; the airship nosed abruptly skyward, and Lieutenant-Commander H. V. Wily—a survivor of the ill-fated Akron, was unable to maintain control. Mr. Swanson, Secretary for the Navy, is opposed to the construction of any more naval dirigibles.

Of the 555 new aircraft provided for in the Appropriations Bill for 1935–36, 282 are for replacement and 273 for expansion. A forecast of the 1936–37 Programme indicates that it will provide for a further 400–500 aircraft. In his Annual Report for 1934–35, the Secretary of the Navy says that a tentative programme has been recommended to provide approximately 1,910 naval aircraft by 1940–42.

PERSONNEL.

Early in 1935 naval appropriations allowed for the following increases in personnel:—165 officers for the Navy and 51 for the Marines Corps; 435 Midshipmen at the Naval Academy; 11,000 enlisted men. The latter will bring the enlisted strength of the Navy from 82,500 men on July 1, 1935, to 93,500 at the close of the fiscal year 1936. This additional personnel is necessary to man extra ships put in commission, to augment the existing complements of the larger vessels, and to meet the increased requirements of the Naval Air Service. It is alleged that the 1936–37 Estimates will make provision for 100,000 men.

The restoration of the final 5 per cent. cut in naval pay—as of other federal salaries—was ante-dated to April 1, 1935, instead of being made on July 1, 1935, as provided by the Budget estimates for 1936.

JAPAN.

In spite of Japan's claim for naval parity with Britain and the United States at the Naval Conference, there can be little doubt that her navy, important though it is acknowledged to be, takes second place to her army in the estimation of her government and people. The navy has been able to play only a secondary role in advancing Japanese ambitions in Manchukuo and China, and as neither Britain nor the United States has shown signs of seriously interfering with these ambitions, the need for a great increase of the fleet has not seemed so pressing.

Nevertheless, Japan now regards herself as a first-class nation and the dominant influence in the Far East, and as such she is unlikely to rest content until it is made patent to the world that, in principle at any rate, she is also a sea Power second to none. Neither Japan nor the United States is a member of the League of Nations; the situation in the China Sea and the Pacific therefore reverts to one of "balance of power" held by the three principal navies. Incidentally there is no reason why, with good will, this should not make for a more stable peace than that which is centred in Geneva.

CAPITAL SHIPS.

The whole of Japan's capital ships should have been modernised before the end of the fiscal year 1936–37; some of them have already undergone two processes of modernisation. The Kirishima and Kongo—originally classed as battle cruisers—are now in hand for their second treatment. The Ise and Hyuga are the last to be dealt with. They will doubtless be converted to all-oil.

The Minister of Marine has stated that in the course of modernisation the ships are docked "to remove the bottom plating and fit bulges and a treble bottom in place of a double bottom." He is also reported to have said that the double bottoms hitherto fitted will not stand up to a modern torpedo.

AIRCRAFT CARRIERS.

The Kaga is undergoing extensive alterations at Kure, and will have an "island" structure like the Courageous, and a funnel instead of the horizontal ducts.

A 10,000-ton aircraft carrier, the Soryu (Blue Sky Dragon) and a 10,000-ton seaplane carrier, the Chitose, are both building at Kure, where the former was launched on December 23, 1935. Two more aircraft carriers, to be called the Hiryu (Flying Dragon) and Koryu (Vivid Dragon), and two more seaplane carriers, the Chiyoda and Mitsubo, are projected.

CRUISERS.

The four earliest 10,000-ton cruisers of the Nachi class have already undergone extensive refits and alterations. The foremost funnel has been heightened, the superstructure has been extended aft to the superimposed turret and now carries two catapults, and the anti-aircraft and torpedo armament have been augmented.

The first three of the 6-in. 8,500-ton cruisers, the Mogami, Mikuma, and Suzuya have been completed; a fourth, the Kumano, is afloat; two more, the Tone and the Chikuma have been laid down. The Tone will have a length on the water-line of 614 ft., extreme beam 63 ft., mean draught at standard displacement 14 ft. 7 in. This is an appreciable increase in beam as compared with the earlier ships. This class carry fifteen 6·1-in. guns, eight 5-in. A.A. in twin turrets, and twelve torpedo tubes. They are fitted with two catapults for two aircraft.

DESTROYERS.

Japan, like Britain and the United States, is restricted both as regards number and size of her destroyers ; yet she is mounting in her new craft an armament comparable to that of French destroyers of 1,000 tons more displacement. On the other hand, it is evident that weight is saved on engines and boilers, as the designed horsepower is just half that of the French craft. The speed is, nominally, only three knots less ; in practice the bigger vessels have considerably exceeded their designed speed, but information about the performance of the new Japanese destroyers is as yet lacking.

Six of the twelve Ariake class are complete. The single 5-in. superimposed gun has been removed from its position before the bridge and is now mounted back to back with the twin turret aft. It is understood that other steps have been taken to reduce top weight, doubtless as a result of the capsizing of the Tomozuru, details of which were given in last year's "Annual." Fourteen similar craft of the 1935 Programme are, or shortly will be, laid down.

Four destroyers, the Yugiri, Hatsuyuki, Kidudzuki and Mutsuki were so severely damaged in a typhoon on September 26, 1935, that they had to be withdrawn from the grand manœuvres. One officer and fifty-two men were lost.

TORPEDO BOATS.

Japan continues to build torpedo boats, as distinct from destroyers. Successors, sixteen in number, to the "Tomozuru" class have increased from 527 tons to 595 tons. They will have an armament of three 4·7-in. guns and three torpedo tubes, one less than the earlier vessels. The designed speed has been increased from 26 to 28 knots. The 5-in. guns in the "Tomozuru" class have been replaced by 4·7-in.

SUBMARINES.

Japan has four classes of submarines—the cruiser type, of which I. 1 to I. 6 are complete, and I. 7 and I. 8 building ; the minelaying type, of which I. 21 to I. 24 are complete ; the fleet type, of which I. 51 to I. 71 are complete, and I. 72 to I. 75 are building ; and the coastal (R.O.) type, of which R.O. 33 is the latest, although higher numbers in that category have been completed some years ago. R.O. 34 is building. The cruiser type are vessels of 1,950 tons above-water displacement, mounting two 5·5-in. guns and six torpedo tubes, and having a speed of 17 knots. The minelayers displace 1,142 tons, and carry one 5·5-in. gun and four tubes as well as mines. The fleet type displace 1,400 tons, and carry one 4-in. gun and six tubes ; the latest have a surface speed of 20 knots. The coastal type are craft of about 700 tons. It is also confirmed that Japan is building miniature submarines, some details of which were given in last year's "Annual."

FRANCE.

Naval opinion in France has been seriously disturbed by the expansion of the German navy on the one hand, and the crisis with Italy and that country's building programme on the other. Apprehension is felt that the "35 per cent. of British naval strength" of the Anglo-German agreement is really only the beginning of the revival of a great fleet on the part of her late enemy. France is, therefore, loath to tie herself by any new treaty which might prohibit her building what she requires to meet these new conditions.

The Naval Estimates for 1936 amount to 1,373 million francs. This, at first sight, is a huge reduction on those for 1935; but actually a sum of about 2,000 million francs has been transferred from the Estimates for the current year to a new Armament Fund, to be raised by loan. The estimated figure is only intended to cover maintenance and not new construction. As such it is lower than the corresponding charges for 1935, on account of the cuts in pay made in July of last year.

BATTLESHIPS.

There are no less than four battleships building or projected—the Dunkerque, of 26,500 tons, afloat; the sister ship Strasbourg, and the 35,000-ton France on the stocks; and the Patrie, also of 35,000 tons, to be laid down on the slip occupied by the Strasbourg as soon as that ship has been launched.

The Dunkerque was floated out of the dry dock in which she had been building at Brest on October 1, 1935. The dock was not long enough to take the full 691 ft. of the hull, and the bow portion was added after the ship had been towed to the Ninon docks. Although the Strasbourg was laid down two years after the Dunkerque, it is anticipated that she will be ready before the end of 1938. The date of completion of both ships is stated to have been considerably advanced. These ships will carry eight 13-in. guns in quadruple turrets, mounted like the Nelson; sixteen 5·1-in. in three quadruple turrets aft and two twin turrets, one each side, farther forward—all capable of being used against aircraft; twelve 3·9 A.A. guns; a number of multiple A.A. medium guns; six torpedo tubes on triple mountings; and one or two catapults. They will each carry four aircraft. It is reported that an 11-in. armoured belt will extend from the foremost 13-in. to the after 5·1-in. turret. Over the vulnerable parts will be a lower deck of about 2 in., above which will be decks of 3 in. and 5 in. thickness. Few details are yet available of the 35,000-ton ships, except that they will be about 794 ft. long; 108½ ft. beam; and have a draught of about 26 ft. 7 in.

The battleships Bretagne, Provence, and Lorraine have all been modernised—the Lorraine more extensively than the two former. The centre turret of the latter ship has been removed and replaced by a catapult with stowage for two aircraft. All three ships have been given improved protection, increased elevation for the main armament, and oil-fired boilers. It is reported that they may now be capable of 23 knots.

CRUISERS.

The six ships of the "La Galissonière" class should all be in service by the end of 1936. The name ship was completed in 1935, and four more were launched in that year. Details of these cruisers were given in last year's "Annual."

France, not being a subscriber to those clauses of the London Treaty which limit the size of destroyers, has built a *contre-torpilleurs* class of vessel of 2,400 to 2,800 tons which must be regarded by Britain as being small cruisers. Thirty of these vessels are completed; two more are building. Although nominally good for 37 knots, on trials all the later ships, at any rate, have greatly exceeded this speed. They are armed with five 5·5-in. (5·1-in. in the case of the six older ships of the class), several smaller guns, and six to nine torpedo tubes. We have no ships of any class possessing their speed, and their armament is heavier than that carried by any of our flotilla leaders. In other words, they combine to outmatch our cruisers in Home or Mediterranean waters completely in numbers, while they outclass all our torpedo craft in fighting efficiency—another legacy of the London Treaty.

SUBMARINES.

France has the greatest submarine flotilla in the world. Built and building she possesses 90 under-water craft. They range from the Surcouf of 2,880 tons, carrying two 8-in. guns and fourteen torpedo tubes, down to a new small class displacing only 597 tons; the latter carrying one 3-in. gun and eight tubes, and having a surface speed of 14 knots and a submerged speed of 10 knots. The latest first-class submarines—eight in number—have a surface displacement of 1,379 tons and carry one 3·9-in. gun and eleven torpedo tubes.

It is reported that six of the nine submarines of the "Caiman" class, completed in 1926–27, have been taken in hand for modernisation.

PERSONNEL.

According to an article in the French Press, the fleet is seriously undermanned. The author estimates that 10,000 more men are required—8,000 for service afloat and 2,000 for the *Aeronautique Maritime*. The proposed Naval Estimates for 1936 provide for an increase of personnel by about 4,600 over 1935. As from July 1 1935, the term of service of the *Inscrits Maritimes* was increased to 30 months with an intermediate stage of 27 months.

With a view to giving them more practical experience of aviation, Capitaines de Vaisseau and Capitaines de Frégate, while awaiting sea appointments, will undergo a course with the Air Force of the region in which they are stationed.

ITALY.

The war between Italy and Abyssinia and the resulting strained relations between the former and other members of the League of Nations has produced a situation in the Mediterranean which has focussed attention on the Italian navy.

Under Mussolini's virile leadership, the fleet has undoubtedly improved greatly as regards both material strength and fighting efficiency since the Great War. Whether the high command would show more enterprise in regard to the employment of the major units than it did then, it is impossible to say; but the gallantry which marked individual exploits by small craft and young officers would undoubtedly not be lacking, and the expansion of the Italian air services and the torpedo and submarine flotillas would afford additional scope for guerilla war in the narrow seas.

BATTLESHIPS.

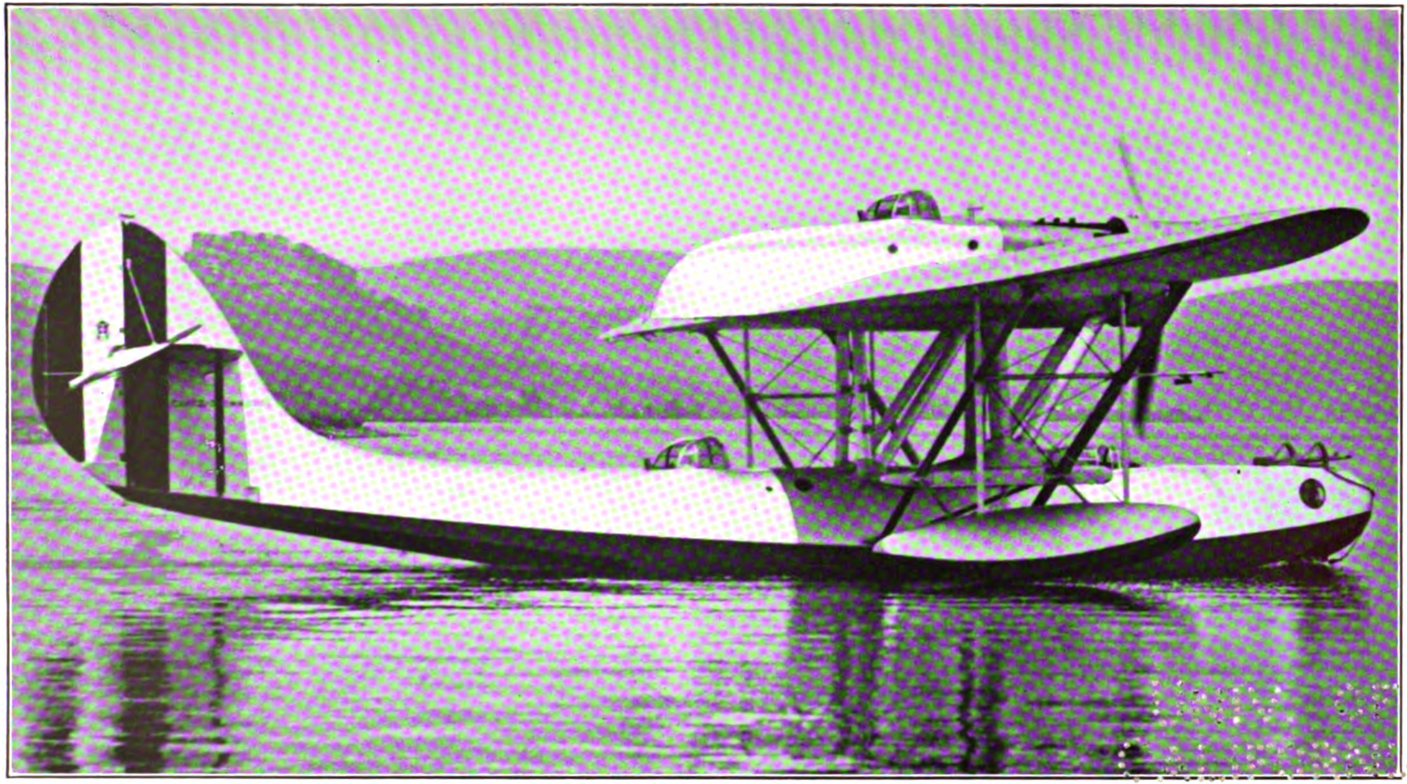
The two 35,000-ton battleships Littorio and Vittorio Veneto were laid down in October, 1934. Few details are, as yet, available but an armament of nine 15-in. guns in triple turrets and a speed of 34 knots is mentioned; in which case these ships will outclass any capital ship in the British Navy in the combination of armament and speed. Admiral Cavagnari has stated that they will have a large radius of action with the greatest speed obtainable—notably superior to the battleships of other nations: they will be well protected and armed. "To-day," he said, "and for no short period, they represent the most powerful ships in the world."

The old battleships Cavour and Cesare are undergoing extensive reconstruction. They are being re-engined with Baluzzo type turbines which are expected to give them a speed of at least 24 knots. They are being lengthened by about 30 ft., the centre turret is being replaced by catapults, and the secondary armament is being modernised.

CRUISERS.

The Filberto Duca D'Aosta, the first of the four ships of the "Condottieri" class, attained a speed of 38 knots on her trials. She is joining the 2nd Squadron as flagship of Admiral Dunti. With stores and ammunition on board she is estimated to displace 9,000 tons, but she is far more lightly built than British cruisers of about the same tonnage. The second ship, the Principe Eugenio di Savoia, was due for completion in January, 1936. Two later ships, the Duca Abruzzi and the Garibaldi, are to be armed with ten instead of eight 6-in. guns, and will displace at least 9,000 instead of the scheduled 7,874 tons. The former was due to be launched in January, 1936, and the latter probably later in the year.

The Montecuccoli, laid down under the 1930 Programme, attained a speed of 39·4 knots on her trials, but without stores or ammunition on board. Although nominally designed to displace 5,857 tons,



THE ITALIAN CANT Z501 FLYING BOAT.

Holds the World's Seaplane Distance Record, Trieste to Berbera (British Somaliland), 3,080 miles non-stop, July 16-17, 1935.

Isotta Fraschini Engine.

she is probably about 7,500–8,000 tons. A sister ship, the Muzio Attendilo, was delayed by engine trouble, but has now joined the fleet.

DESTROYERS.

A recent addition to the destroyer building programme has been four vessels of 1,850 tons, all of which are building at the Orlando Yard at Leghorn. They have been given the names of Alfredo Oriani, Vincenzo Gioberti, Vittorio Alfieri, and Giosue Carducci. They will carry four 4·7-in. and eight smaller guns, and six torpedo tubes. The designed speed is 38 knots. The small 600-ton craft, Spica and Astore, are complete. The latter attained 35 knots on her trials, and in spite of her light construction, is reported to be a good sea boat. Four more ships of the class are completing, making a total of ten of this type.

SUBMARINES.

Italy is rapidly building up a powerful submarine flotilla. She already has sixty-four under-water craft and thirteen more are building. In July, 1935, the Minister of Marine ordered the immediate construction of ten additional submarines, all of which were due to be launched within about six months. These will be vessels of 600 tons with a surface speed of 15 knots. They have been named the Perla, Gemma, Berillo, Diaspro, Turchese, Corallo, Onice, Iris, Ambra, and Malachite.

Two minelaying submarines laid down in 1935 at the Tosi Yard, Taranto, have been named the Foca and Zoea.

MISCELLANEOUS.

The old cruiser San Marco has been converted into a wireless-controlled target-ship, and firing was carried out at her for the first time in August, 1935.

It was officially announced on September 12, 1935, that the Italian naval squadron together with the land and air forces in Italian East Africa had been placed under the High Commissioner for East Africa, General Bono, "in the event of special contingencies of a colonial character or of hostilities of any kind."

Under a scheme which came into force on January 1, 1936, both executive and engineer officers will be divided into two branches, those which will normally serve afloat and those which will be employed exclusively ashore, except in war time. Officers in the "afloat" category will be promoted by "comparative selection," those employed ashore by seniority.

It is reported that the port of Massawa, Eritrea, has been heavily fortified, and now constitutes a powerful naval base in the Red Sea.

GERMANY.

In June, 1935, after direct negotiations in London between British and German delegates, both of which included a strong naval element, an agreement * was reached whereby Germany was to be formally released from the terms of the Versailles Treaty and free to maintain a fleet which would " never exceed a percentage of 35 of the aggregate tonnage of the naval forces of the members of the British Commonwealth of Nations." She was also permitted to build submarines and aircraft. In regard to the former, she may in certain circumstances possess a submarine tonnage not exceeding 45 per cent. of the British tonnage of under-water craft, provided that the 35 : 100 ratio in the total tonnage is not exceeded.

The British Government welcomed the opportunity of coming to a " permanent and definite agreement " with Germany, which in their opinion would " facilitate the conclusion of a general agreement on the subject of naval limitation." This departure from the terms of the Versailles Treaty was strongly criticised by idealists in this country and on the Continent, and it was particularly resented by France. But the fact had to be faced that, since her departure from the League of Nations and the advent of the Nazi regime, Germany had closed her ranks and was already building a navy much in excess of Treaty strength, just as she was creating a new army and a (forbidden) air force. Verbal protests would have been of no avail; and, short of taking measures such as neither Britain, France, nor any of the late allies were prepared to embark upon, there was only one practical course—to admit inability to prevent Germany's re-armament and to limit it by agreement. Thanks to the negotiations being left to a minimum number of experts of the two nations, instead of the usual large and futile international committees, such an agreement was come to with ease and speed.

A New Navy.

Three weeks after the publication of the terms of the Anglo-German Naval Agreement, her new programme of construction was officially announced. This provides for :—

Two battleships, each of 26,000 tons. It is believed that they will be armed with 11-in. guns, and a 5·7-in. A.A. armament. These are the Ersatz Elsass and Ersatz Hessen †; both of which were laid down in 1934, ostensibly as " Deutschlands." The comparatively small calibre of the main armament points to an increased proportion of the displacement being devoted to protection, and to the ships being designed for high speed. In connection with the latter, it is interesting to note that these vessels are to revert to steam turbines in place of the Diesel engines of the " Deutschlands."

Two 10,000-ton cruisers, armed with eight 8-in. guns. Both these ships were laid down in 1935.

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* Full details of the Agreement will be found in the Naval Reference Section.

† It is understood that these ships are to be called the Scharnhorst and Gneisnau, and that they will be ready for launching early in 1936.

Sixteen destroyers, each of 1,625 tons, armed with 5-in. guns, laid down in 1934–35. The first of these vessels are expected to be ready for trials in the Spring of 1936.

Twenty submarines, of 250 tons each. Of these the first went into service on June 29, 1935, and at least a dozen were completed by the end of the year.

Six submarines of 500 *tons, and two of* 750 *tons ;* all these craft have been laid down.

A 15,000-*ton aircraft carrier* is projected.

In addition the following vessels are completing under the pre-Agreement programme :—

The armoured ship Admiral Graf Spee, the third Deutschland, launched in June, 1934, and commissioned for trials in January, 1936.

A gunnery training ship to replace the Fuchs.

Ten minesweepers, designed as fleet escort vessels of 600 tons, and nearly all completed.

The 6,000-*ton cruiser* Nürnberg was commissioned in November last. She is a sister-ship of the Leipzig, completed in 1931.

PERSONNEL.

Germany is providing yet another example of the fact that increasing a navy does not merely imply building more ships, and that one of the great difficulties is the provision of trained personnel, especially officers. An increased number of cadets have been entered in 1935, and still more are to be admitted in 1936. The cruisers Emden and Karlsruhe are being used for the training of executive cadets and cadets for the air force, and the old battleship Schlesien for future ordnance officers, paymasters, surgeons, etc. The period of training is being reduced from 3½ to 3 or possibly 2½ years. In addition, a number of petty officers and mercantile marine officers are being given commissions, and retired officers are being recalled.

BASES.

The increase of the fleet has necessitated additional base accommodation. It is understood that in future the battleships will probably be based on Kiel ; the dry docks there are to be enlarged to take the new ships, and a new floating dock is being provided. The cruisers will probably be based on Wilhelmshaven. Emden, Bremerhaven, and Cuxhaven will also be used ; while Swinemunde and Pillau will have an increased number of vessels based on them.

OTHER CONTINENTAL NAVIES.

ESTONIA.

A contract for the construction of the two submarines, mentioned in last year's " Annual," has been signed with Messrs. Vickers-

Armstrongs, and these craft are under construction at Barrow. They will displace 620 tons and have a speed on the surface of 13·5 knots, and a submerged speed of 8·5 knots.

GREECE.

The insurrection in March, 1935, somewhat disorganised the Greek navy and necessitated a reduction in personnel and consequent limitation of ships in commission. The old battleship Kilkis, which was brought out when the Averoff joined the revolutionaries, and the Averoff herself have both been placed in reserve. The flag of the C. in C., Admiral Sakelarion, is flown in the cruiser-minelayer Helle. This ship, with five destroyers, three submarines, and seven seaplanes in September, 1935, paid the first visit made by a Greek squadron to Constantinople since the War.

Alluding to the irresponsible reports of the damage done to the Averoff by aircraft bombing at the time of the revolt, Sir Bolton Eyres Monsell, First Lord of the Admiralty, in a speech at the annual dinner of the Institution of Naval Architects on April 10, 1935, said that this old cruiser with no deck protection and two antiquated 3-in. A.A. guns steamed slowly out of harbour with a somewhat scratch crew. A modern air force went in pursuit from the same base on the following morning. The next day there appeared " in one of our most enterprising newspapers a photograph of the Averoff with aircraft just over her funnels and explosions taking place on her deck. This was a veritable triumph of ' film ' over ' fact.' . . . The Averoff continued to go about unhampered and undamaged."

A five-year programme provides for the construction of twelve destroyers, not exceeding 1,000 tons displacement. It is understood that four of these vessels will be ordered from foreign yards during 1936.

NETHERLANDS.

It is anticipated that the cruiser De Ruyter will commission in the summer of 1936 for service on the East Indies Station. There are also a small cruiser, the Tromp, four minesweepers, and two submarines under construction. The first-named was originally described as a flotilla leader, but has proved to be a vessel of 3,350 tons, armed with six 5·9-in., six 40 mm. A.A. and four 12·7 mm. A.A. guns ; six 21-in. torpedo tubes ; and four bomb throwers.

The two submarines will be known as the K XIX and K XX, they are craft of 1,091 tons, armed with one 3·5-in. and two 2-pdr. guns, and eight 21-in. torpedo tubes, and are designed to have a surface speed of 20 knots.

NORWAY.

The naval estimates for 1935–36 amounted to 11,561,700 kronen as compared with 10,748,600 kronen in 1934–35. The vote for new construction provides for two torpedo boats (Nos. 120 and 122) and two small patrol vessels of 200 to 250 tons. A sum of 600,000 kronen is also included for repairs to the fishery protection vessel Fridtjof Nansen caused by grounding off Masoy Island in December, 1934.

The two torpedo boats are building at the Horten Navy Yard. They are craft displacing about 625 tons, and will have a speed of about 30 knots, with an armament of three 3·9-in. guns and a double torpedo tube. The first is expected to be completed in the spring of 1936.

A comprehensive programme for rebuilding the fleet has again been postponed on account of lack of financial provision.

POLAND.

The two destroyers mentioned in last year's "Annual" are building at the yard of Messrs. J. S. White, Cowes. The keel of one of these vessels was laid by the Polish Ambassador, Count Raczynski, on July 17, 1935. It is claimed that they will be the largest and the fastest of the class ever built in England. They will displace 2,200 tons and have a designed speed of 39 knots with an armament of seven 4·7-in. guns and six 21-in. torpedo tubes.

Two submarines and a minelayer are being built in France, and a third submarine is authorised. The minelayer will be a vessel of 2,085 tons, armed with six 4·7-in. and four A.A. guns. She will carry 300 mines, and have a speed of 20 knots.

Four trawler minesweepers are being built in Poland.

On June 20, 1935, a sum of approximately £99,750, collected by the Sea and Colonies League, was handed over to the Naval Defence Fund. It will be devoted to the construction of the submarine to be named Marshal Pilsudski.

PORTUGAL.

In May, 1935, the National Assembly approved a sum of £65,000,000 being devoted to the re-organisation of the defence forces and the general economic reconstruction of the country. A fifteen-year plan includes a second naval programme providing for fourteen new warships in addition to the fourteen built during the last five years. Tenders for five destroyers and three submarines —part of the second programme—were called for in March, 1935. These vessels are to be delivered by the end of 1939. Of the fourteen ships in the first programme nine were built in British shipyards and three in Lisbon private yards under the supervision of British engineers.

The first class sloops Alfonso de Albuquerque and Bartolomeo Diaz, both built by Hawthorn Leslie, Newcastle, were handed over on March 7 and May 15, 1935, respectively. The second of the second class sloops, the Infante D. Henrique, is completing at Lisbon Arsenal.

Three destroyers, the Dao, Tejo, and Douro, all built by Yarrow at Lisbon, have completed. These belong to a class of five vessels displacing 1,383 tons, with a speed of 36 knots, and armed with four 4·7-in. and three pom-pom guns, eight 21-in. quadruple torpedo tubes, and two depth charge throwers. Two similar vessels, the Vouga and Lima, were completed at Messrs. Yarrow's Clyde Works in 1933. Two others, built at the same works, the Tejo and Douro, were sold to Colombia in 1934, and are now replaced by similar vessels with the same names.

The submarines Delfin, Espadarte, and Golfinho, of 854 tons surface displacement, have been completed and handed over by Vickers-Armstrongs, Barrow.

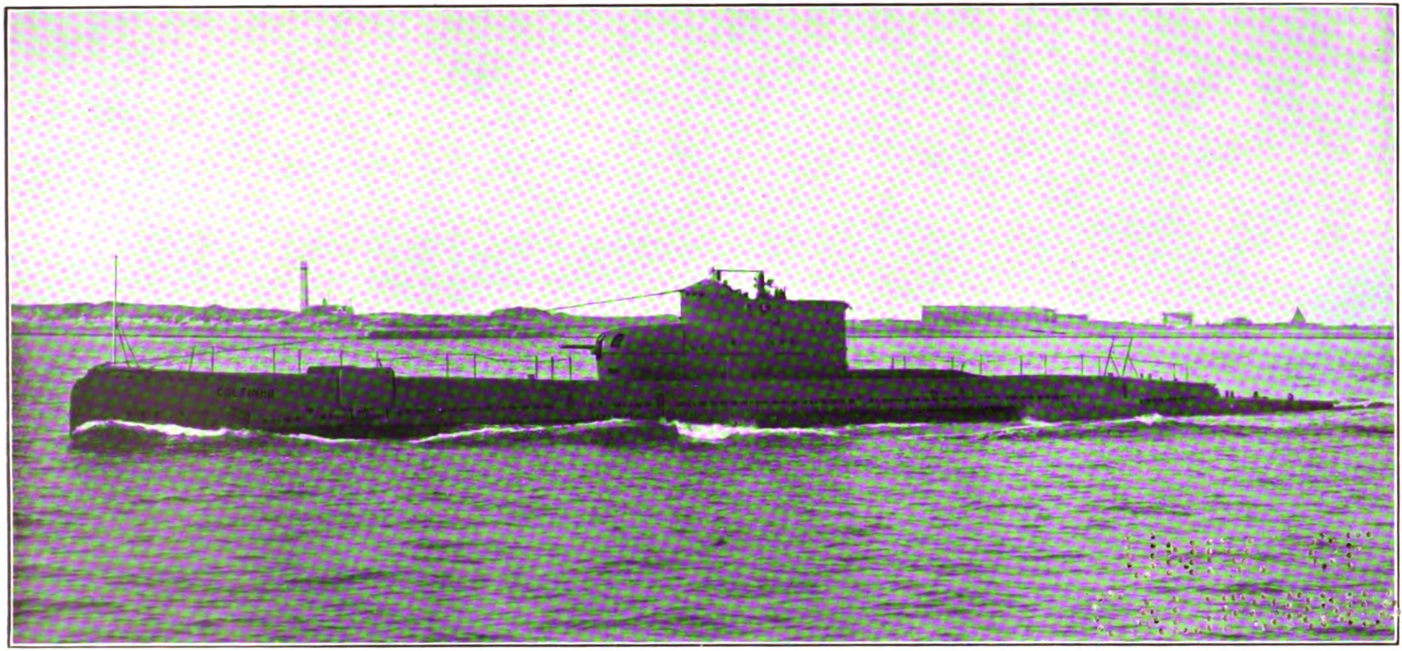
SOVIET UNION.

The obscurity which generally surrounds the naval affairs of the Soviet Union was penetrated in some degree by an article from a late Lieutenant-Commander in the Imperial Russian Navy entitled "Soviet Naval Doctrine" which appeared in the Journal of the Royal United Service Institution of August, 1935. This indicates that while naval thought and policy are still entangled with bolshevik politics, yet common sense and cold facts are gradually compelling the government to adopt a more practical attitude towards naval problems. Voroshilov is reported to regard the strengthening of sea power as the next step in the re-organisation of the defence of the Soviet Union.

With the development of manufacturing facilities, there has been a revival of interest in warship construction, and even the battleship is coming back as a type which it is considered must be included in future building programmes. Until lately, sheer inability to produce modern warships of large displacement has, probably, had as much to do as any definite doctrine, with these being eliminated from defence plans; but battleships now take their place with submarines, aircraft, fast torpedo motor-launches, and motor-launch carriers in projected construction. This does not mean that any comprehensive programme is being embarked on. Change of political creed has not altered the national characteristics of the Russian which pre-eminently incline towards a mountain of abstract argument before bringing forth even a mouse of execution.

So far as can be ascertained, recent additions to the Soviet fleet have been mainly confined to a number of small submarines, most of which have gone to reinforce the flotilla at Vladivostock. It is reported that five destroyers, fifteen submarines, twelve submarine chasers, a number of auxiliaries, twelve bombers, and fourteen fighters participated in the summer manœuvres and a naval review of the Far Eastern Fleet in 1935. The submarine B. 3 was sunk on July 25, 1935, as the result of a collision during manœuvres in the Gulf of Finland. The entire crew of forty-eight and seven cadets perished.

The long-standing dispute as to the ownership of Wrangel's fleet of ex-Russian warships, which has lain rotting at Bizerta for many years, has been terminated by the decision of the French Ministry of Marine to break up all the vessels except one battleship



THE PORTUGUESE SUBMARINE GOLFINHO.

Completed, 1935.

(*By courtesy of the builders, Vickers-Armstrongs, Ltd.*)

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for which as yet no adequate offer has been made. The proceeds of the sale have been paid into a fund known as the *Sequestre des Biens Russes* in a department called the *Administration des Biens Droits et Interets Russes en France.*

SPAIN.

The international situation, and more particularly Italy's ambitions and activities have combined to call attention to the Spanish naval position in the Mediterranean. As long ago as March 1935, the Minister of Marine introduced a Bill to provide for a five-year programme of vessels necessary for the defence of the Balearic Islands. This programme included new flotillas of submarines and destroyers, and a number of auxiliary craft. It also made provision for equipping the bases at Mahon, Palma, and Pollensa to enable them to meet present-day requirements. The two latter were to be depots for large stores of mines. In view of more recent events, and as the result of careful stocktaking, however, this programme is likely to be modified.

The 10,000-ton cruiser Canareas, laid down at Ferrol in 1928, is at last complete; but her sister ship, the Baleares, laid down at the same place and in the same year, is not expected to be ready before the end of 1936. Four 2,000-ton minelayers, the Jupiter, Neptuno, Saturno, and one as yet unnamed, are completing at Ferrol. These vessels will have a speed of 18·5 knots and will carry 264 mines.

Two submarines, D. 2 and D. 3, are also building. Five submarines, C. 2 to C. 6, visited Plymouth from August 13 to 17, 1935.

SWEDEN.

The Estimates for 1935–36 amount to Kr. 39,666,380, which is over Kr. 4,000,000 more than those for the previous year, and Kr. 8,500,000 more than for 1933–34. The principal increases are for victualling, clothing, etc., personnel and manning, and replacement building.

Two destroyers, the Goteborg and Stockholm, are building at Goteborg and Karlskrona; they are expected to complete in the spring and autumn of 1936 respectively. These are vessels of the "Ehrenskold" class displacing 895 tons, carrying three 4·7-in. and two 2-pdr. A.A. guns and six 21-in. torpedo tubes, and having a designed speed of 35 knots.

Four vedette boats are projected; the smaller type displacing 60 tons will be armed only with machine guns; the larger type of 350 tons will carry two 75 mm. guns as well as machine guns.

The projected coast defence ship does not appear to have advanced beyond the stage of design, details of which were given in last year's "Annual."

SOUTH AMERICA.

ARGENTINA.

A contract for a new training cruiser has been given to Messrs. Vickers-Armstrongs, and the ship is being built at Barrow. She will displace about 6–7,000 tons, and carry an armament of nine 6-in., four 4-in. A.A. and eight 2-pdr. A.A. guns; also six torpedo tubes on triple mountings; and will be equipped with a catapult and two aircraft. The designed full speed is 30 knots. Accommodation will be provided for 60 cadets in addition to a complement of 543. The vessel is due for completion by the end of 1937, when she will replace the present masted training ship Presidente Sarmiento. Captain Mario Fincati arrived in England in September, 1935, as head of the Naval Commission which will represent the Argentine Government during the construction of the vessel.

Five small sloops, modernised editions of the "M" class bought from Germany in 1922, were laid down during 1935, and are building in Argentine yards.

BRAZIL.

Details, in addition to those given in last year's "Annual," regarding the modernisation of the battleship Minas Geraes include the replacement of the original two funnels by a single one, amidships; two stump masts carry a pair of main derricks—one each side; the bridges and control positions have been rearranged and long-base range-finders installed; and the gun positions of the secondary armament have been altered to improve efficiency. Financial difficulties have so far delayed the execution of the greater part of a building programme which was to include two cruisers, nine destroyers, six submarines, and certain auxiliaries; but orders for the six submarines were placed in Italy in the autumn of 1935.

The Government have been devoting much attention to the Naval Air Service, and have created a new organisation known as the Marine Air Force. This has been given a considerable degree of independence from the control of the Ministry of Marine. The force is run by a Directorate of Aeronautics which deals with the technical and administrative services, but it is under the Naval General Staff for operational training. It includes units for service with the fleet and also for operating from shore bases in defence of ports and of the coast generally. The naval air bases come under the orders of the Commanders of Naval Districts.

CHILE.

The Chilean Navy appears to be recovering from the ill-effects of political upheavals and efforts have been made to restore the fleet to its former efficiency and strength. Early in 1935 a measure came before the Senate which made provision for commissioning the battleship Almirante Latorre, which had been laid up in reserve, and for maintaining in commission the cruiser Blanco Encalada, three destroyers, three submarines, and a number of auxiliary craft, including the cadet training ship Baquedano.

So far, however, no steps have been taken to provide the additional officers necessary.

COLOMBIA.

Captain B. O. Bell-Salter, R.N. (ret.), who went out in command of two destroyers which Colombia bought from Portugal, now holds the rank of Rear-Admiral in the Colombian fleet, and is in command of the sea-going units. Another British naval officer, Captain R. D. Binney, R.N. (ret.), has been permitted to accept service with the same navy, and commands the training ship Cucuta.

Like Chile, Colombia evidently realises the advantages of availing herself of British experience in naval training and ship-building; and with these aids, the efficiency of her fleet is steadily improving.

ECUADOR.

The Government have purchased Mr. W. K. Vanderbilt's yacht Ava, a vessel of about 800 tons, propelled by a Diesel engine. She is being armed as a patrol vessel and has been renamed the President Alfaro.

MEXICO.

A programme of construction, to include four small destroyers and six torpedo boats, is under consideration. These would probably be built in Spain. Ten patrol boats, G. 20–29, have recently been completed at Bilbao, Spain. These are vessels of 180 tons, carrying two 25 mm. A.A. guns forward and two 13 mm. A.A. guns aft. Their designed speed is 26 knots.

URUGUAY.

The three patrol craft, Salto, Paysandu, and Rio Negro, were completed at Ancona, Italy, and turned over to their Uruguayan crews in October, 1935. These are vessels of 150 tons, with a speed of 16 knots.

E. ALTHAM,
Captain, C.B., R.N.

CHAPTER III.

RELATIVE NAVAL STRENGTH.

SINCE the last issue of "Brassey's Naval Annual," the denunciation of the Washington Treaty by Japan, followed by the abrogation of the Treaty of Versailles by Germany, has brought questions connected with relative naval strength prominently before the peoples of the principal sea Powers. Over a period of fourteen years, conditions had been more or less stabilised by these treaties. There had naturally been many discussions as to the manner in which this or that Power was interpreting the terms of the pacts, how far each was short of its allotted treaty strength, and so on; but there always remained the maximum which might not be exceeded without due notice. The end of the treaties would mean the removal of a steadying influence on competitive building. No doubt the world, as the First Lord said in the House of Commons on March 14, 1935, has appreciated the inestimable benefits that were obtained from the Washington Treaty of 1922. It certainly brought some measure of calm to the face of the waters. Towards its continuance, no government made greater sacrifices than that of Great Britain, which accepted lower degrees of strength than had ever been known in modern times in order to facilitate agreement with other countries.

A salient feature of British official policy in regard to naval affairs during 1935 was the admission that no response had been made to the gestures of goodwill in the form of reduced British shipbuilding programmes. Rearmament had become essential. The form it would take was left to be determined by the Naval Conference called in December, 1935, a subject dealt with in another chapter. But it was made clear long before the Conference met that the ratio system inherent in the Washington and London Treaties would not be continued. The First Lord of the Admiralty, speaking in the House of Commons on July 22, 1935, announced that "the principle of ratio has had to be abandoned. We have had to give up any idea of ratio for the future because some countries felt it wounding to their national pride to have to accept a naval strength permanently inferior to that of some other country. We, therefore, have had to abandon the principle of ratio and, instead of asking naval Powers what the ultimate strength of their navy was going to be, we have to ask, what size navy do you propose to have in 1942? That in fact is the date we have taken. As I say, we have had to abandon all ideas of ratios in trying to perpetuate the state under which we have been living under the Treaty of Washington, and we have gone in for a system of programmes."

But while 1935 saw the disappearance of the ratio principle, so far as the five leading Powers are concerned ,it also witnessed its reappearance in a new direction. On June 18, 1935, Germany voluntarily entered into an agreement with Great Britain that the future strength of the German Navy in relation to the aggregate naval strength of the members of the British Commonwealth of Nations should be in the proportion of 35 : 100. In the course of a debate on the situation created by this agreement, in the House of Lords on June 26, 1935, Lord Londonderry, replying for the Government, said that, " taking France's present naval strength at about fifty per cent. of our own naval strength, this agreement affords to France, at present levels, a permanent superiority of 43 per cent. over the German Navy as compared with an inferiority of some 30 per cent. before the War." In all the arguments about the agreement, none went to show that the naval position of either France or Italy would have been stronger had this agreement not been concluded. The Government's view was that in accepting the German offer they had acted for the best in a situation admittedly not free from difficulties. As Lord Beatty pointed out, supposing Germany had said 50 per cent., what should Great Britain have done ? We could not have stopped her. But the gesture did away definitely and completely with all possibility of rivalry on the sea between the two countries. It does not limit the number of ships we may possess, nor prevent us from building what we like. " But it does ensure," said Lord Beatty, " that there will be no competitive building programme between us and at least one country in the world, which I maintain is something to be thankful for."

The revival of the German Fleet is, however, the outstanding feature of a review of relative naval strength at the present time. It removes one of the main arguments of the advocates of further retrenchment in the British Fleet. Three or four years ago, it was possible to contend that while the Royal Navy had been reduced considerably (from about 2,000,000 tons of the 1914 level to approximately 1,150,000 tons), yet on the other hand the German Fleet, its main rival in 1914, had been reduced from about 1,100,000 tons to 140,000 tons ; that the Austro-Hungarian Navy, then allied to Germany, had ceased to exist ; and that the Russian Navy had also virtually ceased to exist. The situation in both Germany and Russia is now radically changed, and the French and Italian navies, particularly the Italian, are far stronger relatively to the Royal Navy than they were immediately after the signing of the London Treaty of 1930.

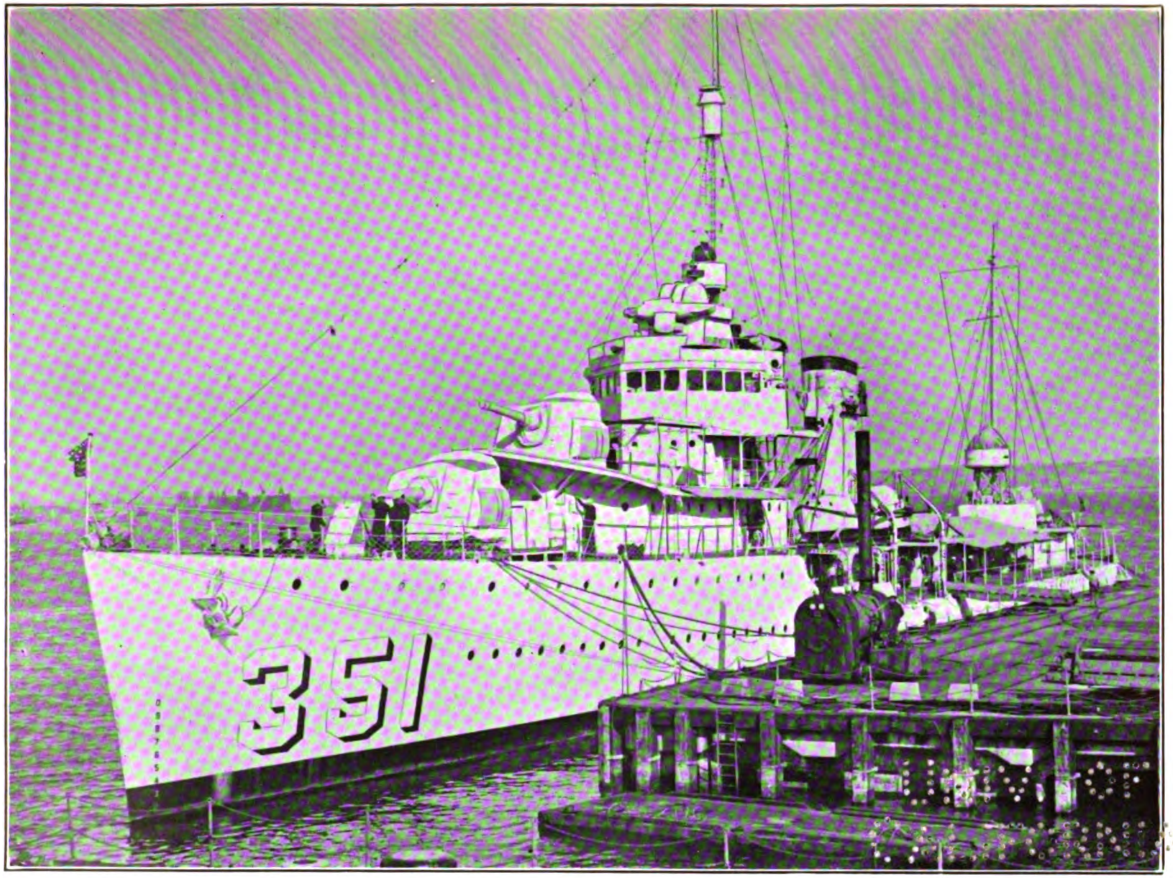
The extent to which Germany implements her new agreement and the speed with which she builds the new units to which she is entitled will have an important bearing on the future naval position in Europe. Her effective tonnage in battleships on January 1, 1936, was five ships of 59,120 tons, or including the Admiral Graf Spee, commissioned on January 6, 1936, six ships of 69,120 tons. Three out of these six ships, of 39,120 tons, are thirty years of age and overdue for replacement. The effective tonnage is therefore only three " Deutschlands " of 30,000 tons. The British capital ship tonnage is 474,750, of which 35 per cent. is 166,162 tons. This is sufficient for Germany to build immediately five more 26,000-ton battleships, including the two such vessels she laid down in 1934. As regards cruisers, 35 per cent. of the British cruiser tonnage allowed by the London Treaty would give Germany 118,650 tons. She has now six ships of 35,400 tons. The difference is sufficient to allow her to build immediately eight 10,000-ton cruisers, including the two of this tonnage which she laid down in 1935. Moreover, any increase of British cruiser tonnage would increase the proportion available for Germany.

While Germany has only built about one-fourth of her allowance in cruiser tonnage under the agreement, in destroyers she has built only about one-sixth; 35 per cent. of the British strength under the London Treaty would give her 52,500 tons, towards which she has already built only twelve vessels of 9,600 tons. The balance is sufficient to allow for the construction of 26 large destroyers of the 1,625-ton type, with five 5-in. guns, now in hand. But her greatest possible effort may be in submarines, of which she was formerly allowed none; 35 per cent. of the British tonnage would allow her 18,445 tons, enough for 36 submarines of an average of 500 tons each. Actually in 1935, she put in hand 28 submarines of three different types, 250 tons, 500 tons and 750 tons, and 14 of the smallest class were completed before the end of the year. Only 31 British submarines have been laid down and completed in the 17 years since the War.

MERCHANT SHIPPING.

Intimately bound up with the question of relative strength are the factors of population and mercantile shipping. In a manifesto dated November 9, 1935, the Navy League pointed out that while the number of ships in the Royal Navy declined from 457 in 1914 to 278 in 1935, and from 146,047 officers and men in 1914 to 94,482 in 1935, yet the responsibilities of the Navy were not less but greater. The population of the United Kingdom has increased. To-day there are 4,900,000 more mouths to feed. At the same time, our merchant fleet has decreased, so that in time of war every British merchant ship sunk or captured will represent a greater loss to the supply service than was the case during the last War. In one of the last public speeches he made, at the annual Nelson Day Dinner of the Navy League, the late Admiral of the Fleet Lord Jellicoe said :—

> Sea power means the power to use the sea for the carriage of necessaries, which, in the case of the British Empire, means two-thirds of the food for the people of the United Kingdom, the great majority of the raw material required for manufacturing, and the whole import and export trade of the United Kingdom, the Overseas Dominions and the Colonies. How are we situated now in this matter? To use the sea you must have ships, and it is a lamentable fact that the percentage of world tonnage possessed by the British Empire has fallen from 45·2 per cent. in 1914 to 35·1 per cent. in 1925, and to 31·8 per cent. in 1935. . . . Our dependence on the Merchant Service is clearly shown by the fact that during the Great War, with 45 per cent. of the world tonnage, we were to a considerable degree dependent on neutral ships to carry our goods; obviously, we should be still more dependent on neutral countries for the carriage of our supplies in the unhappy case of another great war, a lamentable position.



[Photo by Cribb, Southsea.

THE U.S. DESTROYER MACDONOUGH.

On a Visit to Portsmouth, September, 1935.

CAPITAL SHIPS.

The question of battleship replacement came to the forefront of public affairs during the General Election. For so many years it had been accepted that no new battleships could be laid down, under the Washington and London Treaties, until 1937, that the interest which had been shown in this matter had been remote. Added to this was the increasing doubt in the minds of many people whether battleships would ever again be able to fulfil their former role, owing to the advance in air power, and whether some smaller type of capital ship could not be accepted instead. Mr. Baldwin surprised many people when in a speech during the election campaign he said that 12 out of the 15 British capital ships were largely obsolete, because they were laid down before the Navy had recognised the need for protecting itself against aircraft attack. The exceptions are the Nelson and Rodney, completed in 1927, and the Hood, completed in 1920. Of the 12 British battleships, only 2 have been built since 1926 ; 7 are over 15 years old and 3 over 20, these being now over the official treaty age limit. Our three battle cruisers are all over 15 years old, and two are approaching 20 years of age.

Obsolescence in the battleship class affects all the leading naval Powers, and it is possible to show that the average age of the ships of Great Britain, the United States and Japan is about the same. The degree of their effectiveness therefore turns largely upon the extent to which they have been modernised. In regard to the question of modernisation, the First Lord made the following statement in his Estimates speech of March 14, 1935 :—

> I have heard a good many people refer to this as a policy of putting new wine into old bottles, but I think a better analogy for ships can be found, and I would rather say it was re-corking old bottles ; and, as some hon. members know, if that is not done in time, the whole contents of the bottle is ruined. We have lagged behind the other great Powers for a long time in the modernisation of our capital ships. The United States of America have modernised 10 of their 15 ships at a cost of about £16,000,000, and we anticipate that Japan will have modernised the whole of her ships by the beginning of 1937. We have only modernised—if we can call it modernised—one ship, and we are asking for the modernisation of more ships under these headings. Modernisation is really due to some ships wanting re-engining ; they are worn out, and therefore no good without new engines. The other great item of modernisation is the very necessary provision of anti-aircraft protection.

Large sums of money have been spent upon British battleship refits in recent years—Lord Strabolgi, in an election speech, put it at £10,000,000—but this has been mainly devoted to elementary precautions, such as fitting anti-torpedo bulges and installing anti-aircraft guns. The deck armour of certain ships has been improved, and catapults and aircraft fitted.

At the beginning of 1936, seven battleships were building for Continental Powers, three for France, two for Italy and two for Germany. The first of these is the Dunkerque, laid down in 1932, which was launched on October 1, 1935. The Dunkerque and her sister-ship the Strasbourg are of 26,500 tons, with eight 13-in. guns, and represent the medium-size battleship for which Great Britain has contended at the Naval Conferences. Germany, after breaking away from the Versailles Treaty, also favoured a displacement of 26,000 tons for the two ships she laid down to replace the Elsass and Hessen ; these will each carry nine 11-in. guns. Italy, however, in deciding to build the Vittorio Veneto and Littorio, went to the maximum displacement under the Washington Treaty (35,000 tons) and to a larger calibre of gun (15-in.). The influence of this is to be seen in the decision by France to build two vessels of similar tonnage, the France and the Patrie.

All three of the Continental Powers are thus between two and three years ahead of Great Britain in post-Treaty battleship construction, and France nearly five years ahead.

PRESENT CRUISER TOTALS.

The cruiser totals of the Powers at the beginning of 1936 showed that the number of British cruisers had increased during the previous year from 50 to 54, by the retention of ships due to be prepared for sale ; that no change had taken place in those of the United States (26) and France (17) ; that Japan had added two ships, making a total of 33 ; and that Italy had increased from 24 to 27. The output since the War is shown in the accompanying tabular statement.

CRUISERS COMPLETED FOR THE PRINCIPAL POWERS.

	Great Britain.	U.S.A.	Japan.	France.	Italy.	Germany.
1920	—	—	1	—	—	—
1921	1	—	4	—	—	—
1922	4	—	3	—	—	—
1923	—	6	3	—	—	—
1924	1	3	1	—	—	—
1925	1	1	3	—	—	1
1926	2	—	2	1	—	—
1927	—	—	2	2	—	—
1928	7	—	1	2	—	—
1929	4	1	3	—	2	2
1930	3	4	—	2	—	1
1931	1	3	—	2	4	1
1932	—	2	4	2	6	—
1933	2	1	—	—	1	—
1934	2	4	—	1	—	—
1935	4	—	2	1	3	1
	32	25	29	13	16	6
Building .	12	12	3	5	3	2

AUGMENTED CRUISER STRENGTH.

The official Return of Fleets (Cmd. 5038) as on January 1, 1936, gives the fairest and most reliable guide to the strength of the Royal Navy in relation to that of the principal foreign Powers, always remembering that figures of ships or tonnage alone are no real criterion of effective power. The totals of cruisers shown in this return are as follows, and by way of comparison the corresponding totals six years earlier, at the time of the assembly of the London Naval Conference, are given :—

CRUISER STRENGTH, 1936 AND 1930.

	Great Britain.	U.S.A.	Japan.	France.	Italy.	Germany.
January 1, 1936 .	54	26	33	17	27	6
January 1, 1930 .	54	19	29	14	12	7

In 1930, Great Britain had more than a two-Power standard in cruisers, measured against the two next strongest Powers, viz. 54 ships to their 48. She was also more than equal to a three-Power standard as regards European Powers. In 1936, her cruisers were fewer than those of the two next strongest Powers, viz. 54 as compared with 59, and the margin over the three European Powers had almost disappeared. Actually, the decline in British strength has been rather more than is indicated by the mere figures. Of the 54 British cruisers, 3 were due to be prepared for sale, and 19 others had passed beyond the official age limit of 16 years. In other words, 40 per cent. of the total of 54 was represented by obsolete ships. No other fleet has so large a proportion of old tonnage. In the case of Italy, 11 out of her 27 cruisers are over the limit of 16 years, and this figure, as in the case of Great Britain, represents 40 per cent. ; but Italy has a higher proportion of new tonnage, completed within the last six years. Analysed according to the official age limit of 16 years adopted in the London Treaty, the cruisers of the various Powers are as follows :—

	Under-age.	Over-age.	Percentage Over-age.
Great Britain . . .	32	22	40
United States . . .	25	1	4
Japan	29	4	12
France	13	4	23
Italy	16	11	40
Germany	6	—	—

The net result of British cruiser construction since the War, therefore, is that the Royal Navy is left with the largest preponderance of old tonnage of any of the principal Powers. The present total of 54 cruisers is made up as follows :—

" C " class, completed 1916–1922, 3,895–4,290 tons, four or five 6-inch guns	15
Brisbane and Adelaide (Australian Navy), 1916–1922, 5,120 tons, eight or nine 6-inch guns	2
" D " class, completed 1918–1922, 4,850 tons, six 6-inch guns	8
" E " class, completed 1926, 7,550–7,580 tons, seven 6-inch guns	2
" Hawkins " class, completed 1918–1925, 9,700–9,996 tons, six or seven 7·5-inch guns	4
" County " class, completed 1928–1930, 10,000 tons, eight 8-inch guns	13
" York " class, completed 1930–1931, 8,400 tons, six 8-inch guns	2
" Leander " class, completed 1933, 7,000 tons, eight 6-inch guns	6
" Arethusa " class, completed 1935, 5,220 tons, six 6-inch guns	2
Total	54

On January 1, 1936, out of this total of 54 cruisers, 22 had passed beyond the official age limit of 16 years, and 32 were within that limit; 31 out of the 54 were of War or pre-War design, and 23 of post-War design.

BRITISH CRUISER INCREASE.

The proposed increase of the total of British cruisers to 70, of which 60 will be under-age and 10 over-age, in the White Paper issued on March 2 will involve the building of some 23 new cruisers in the years 1936 to 1942, additional to those already provided for. The twelve cruisers building or authorised on January 1, 1936, will increase the total of 32 under-age cruisers to 44 by the end of 1938. This would leave 16 new cruisers to be built for a total of 60. Laid down at the rate of five or six a year in 1936, 1937, and 1938, it would not be until 1941 that they would all become effective. By that time, however, seven cruisers now within the age limit will have passed it—the Durban (completed in 1921), the Despatch, Diomede, Capetown, and Adelaide (completed in 1922), the Frobisher (completed in 1924), and the Effingham (completed in 1925). To replace these vessels seven more cruisers will have to be provided in addition to the 16 previously mentioned, a total of 23. Allowing three years from date of authorisation to date of completion for service, these 23 cruisers would require to be laid down in 1936, 1937, 1938, and 1939 to become effective in 1939, 1940, 1941, and 1942. Any less figure would not provide an establishment of 60 under-age cruisers by 1942.

FLOTILLA LEADERS AND DESTROYERS.

During 1935, Great Britain completed one flotilla leader and seven destroyers, thereby increasing her total from 161 to 169, as no ships of this class were scrapped, but seven were due to be prepared for sale. The totals of France (71), and Italy (96), showed slight increases ; those of the United States (213), Japan (96) and Germany (12) reductions. The large United States total is the legacy of her War output on behalf of the Allies, and all but eight of her vessels are over the age limit. An active rebuilding policy is in full swing, and 53 leaders and destroyers were under construction at the beginning of 1936. Of the 169 British leaders and destroyers, 110 are beyond the age limit of 12 years adopted for this class, and only 59 are within that limit; that is, 65 per cent. of the total number of destroyers are obsolete. These over-age destroyers have their uses in peace-time, but in case of war no reliance could be placed on them, as was demonstrated by their inability to stand up to heavy weather without risk of damage or loss during fleet exercises. Of the Japanese flotilla of 96 vessels, only 21 are over-age, less than one-third of the proportion of similar vessels in the Royal Navy.

Attention has been called in past issues of "Brassey's Naval Annual" to the building of large and heavily-armed flotilla leaders and destroyers by foreign countries, particularly France, which has 32 vessels in this category of an average displacement of 2,432 tons, built and building, although the limits in the London Treaty were 1,500 tons for destroyers and 1,850 tons for flotilla leaders. The concern with which the Admiralty regard the building of such large torpedo craft—virtually small cruisers—was admitted by Lord Stanley, Parliamentary Secretary, when introducing the Supplementary Navy Estimate on February 24, 1936. Included in the estimate was provision for an additional destroyer flotilla of the "Tribal" class, the displacement of which will be 1,850 tons, as compared with the 1,350 tons of the destroyers of the "Greyhound," "Hero" and "Intrepid" classes built under the Estimates of 1933–35. Seven of the larger "Tribal" class can be built for the cost of nine of the smaller tonnage.

SUBMARINES.

Although France completed seven submarines in 1935, her total declined from 96 to 82 by the scrapping of a number of War-time boats. The United States therefore heads the list in this class with 84 vessels, but all except nine of them are of War construction or design. Italy increased her total from 59 to 64 and is now third Power in this type, so far as numbers are concerned. Fourth place is taken by Japan, whose total is unchanged since last year at 57. Among the submarines building in Japan are some much heavier and more powerful than those in British yards, notably the I.7 and I.8, of 1,950 tons, armed with two 5.5-in. guns.

Germany re-entered the list of submarine Powers in 1935 with such vigour that although it was only in March that her intention to build such vessels was made known, six small submarines were commissioned between June 19 and August 13, and took part in exercises in the last-named month. Another wave of submarine activity also occurred in Italy. No vessels had been laid down since the 22 begun in 1931, until July, 1935, when twelve were ordered; ten of 600 tons and 15 knots were required to be launched in six months, and two of 915 tons were to be fitted as minelayers.

Compared with German and Italian activity the British replacement programme of three new submarines a year has been singularly modest.

Coastal Motor-Boats.

The order placed by the Admiralty in the autumn of 1935 with the British Power Boat Company, of Southampton, for six coastal motor torpedo-boats was the first of its kind since 1922. The only other Powers which maintain these " mosquito craft " at present are France and Italy, which have 9 and 42 boats respectively. The speed of the British vessels has not been disclosed, but it is known that Mr. H. Scott-Paine, the designer, has been experimenting for some years towards his ideal of a 60-footer which can travel at 60 miles an hour. Fifteen such craft, it is claimed, could be built for the price of one destroyer.

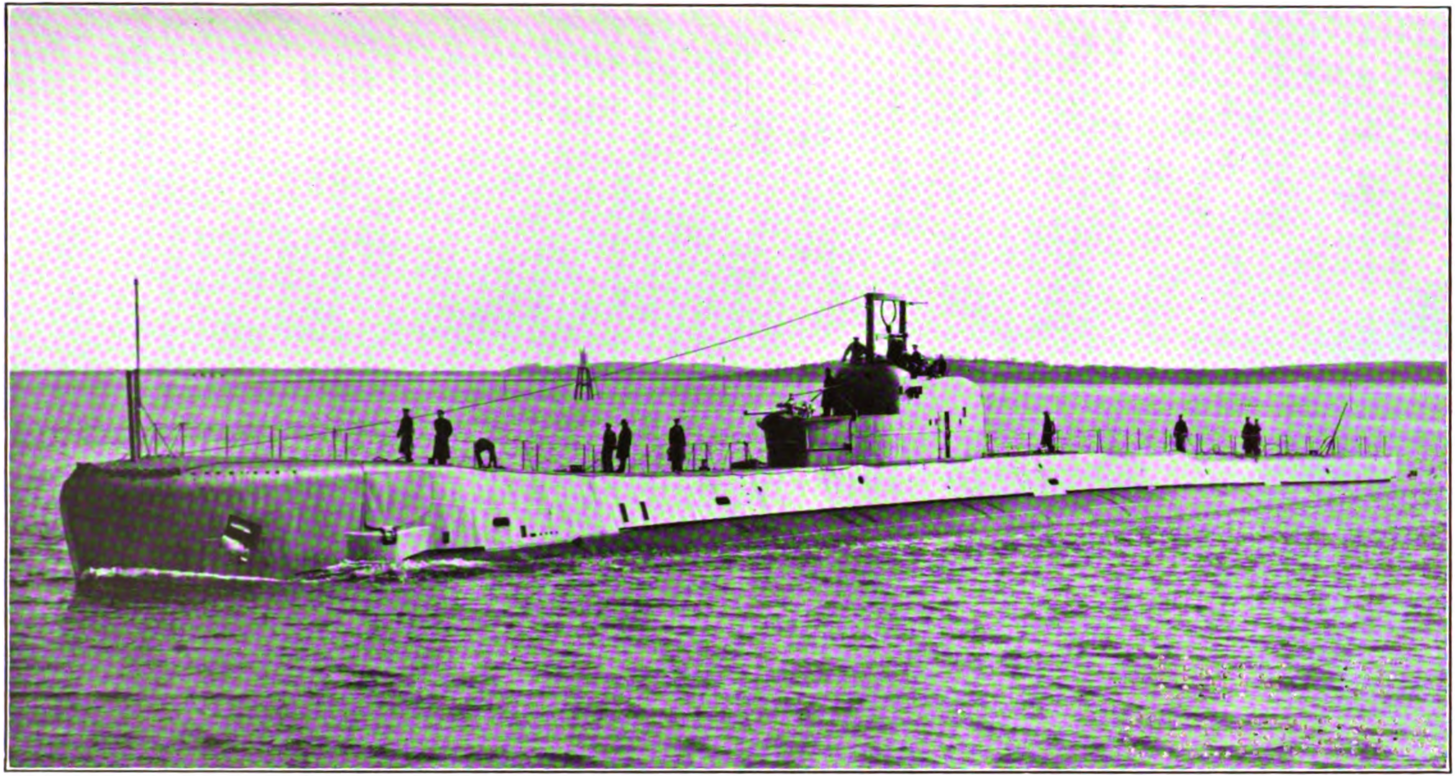
Another new type which appeared in the building lists in 1935 was that of the " fleet escorts " laid down for the German Navy. They are of 600 tons, and will be armed with two 4·1-in. and four smaller guns. The first was completed on December 16, 1935.

Aircraft.

The expansion scheme for the Royal Air Force announced in both Houses of Parliament on May 22, 1935, provides for a home strength of 1,500 first-line machines, irrespective of the Fleet Air Arm. This compares with an actual first-line figure at that date of 580 machines (excluding the F.A.A.) and with a total of 840 which would have been reached under the former expansion programme of July, 1934. Mr. Baldwin explained that as Herr Hitler had made it clear that his goal was parity with France, " we are basing out estimates on that strength . . . for the parity of the three nations we have taken a figure round about 1,500 first-line aircraft." In that figure, oversea units are not included, nor that portion of the Fleet Air Arm which may happen to be in home waters.

The foregoing expansion plans were subsequently recast (as described in the White Paper on Defence, dated March 3, 1936). The execution of the revised programme, including the full provision of war reserves, will extend into 1937 and 1938. The increased first-line establishment which will result from these measures will provide a total of 129 squadrons at home (of which 20 will be non-regular) with a strength in first-line aircraft of approximately 1,750. These figures are given in the Memorandum of the Secretary of State for Air, dated March 2, 1936, which accompanied the Air Estimates. They are in all cases exclusive of the Fleet Air Arm, and they compare with 53 squadrons and 580 first-line aircraft on April 1, 1935.

The existing strength of the Royal Air Force overseas is 25 squadrons, distributed between Malta, Egypt and the Soudan, Palestine and Transjordan, Aden, Iraq, India, and Singapore. They will be maintained during 1936 at a first-line strength of approximately 270 first-line aircraft. In the White Paper on Defence,



H.M. SUBMARINE CLYDE.

Commissioned for Trials and Service, February 9, 1935.

(By courtesy of the builders, Vickers-Armstrongs, Ltd.)

UNIV. OF
CALIFORNIA

however, the formation by 1939 of a further 12 squadrons for service overseas has been approved.

As for the Fleet Air Arm, it is to be increased during 1936 by 27 first-line aircraft. The Secretary of State for Air also states in his Memorandum that proposals are under consideration for a reorganisation of catapult units, and "on this basis the Fleet Air Arm will attain a strength approximately equivalent to 21 squadrons, with a first-line strength of 217 aircraft, by the end of the current year."

The numbers of aircraft of the Fleet Air Arm increased during 1935 from 165 to 178—those borne in aircraft-carriers from 138 to 144, and those catapulted from battleships and cruisers from 27 to 34. An exact comparison of this total with those of other countries is not easy owing to the differences in the organisation and control of aircraft. The following table, however, shows the numbers of ship-borne aircraft of the nations concerned and also those shore-based aircraft which are trained and equipped for naval air operations :—

	U.S.A.	Japan.	British Empire.	France.
Ship-borne . . .	455	210	178	81
Shore-based . .	182	190	72	127
Totals . . .	637	400	250	208

The totals in the foregoing table represent operational aircraft. They would be much higher if training, communication and other aircraft were included. The United States Navy, for example, had on July 1, 1935, a total of 974 service aeroplanes effective, and another 472 on order. In one of the fleet problems held during the year approximately 400 naval aircraft took part.

The inferiority of Great Britain in naval aircraft is most marked. It is even more so when considered in relation to her commitments in regard to the trade routes and to the extent of coastline to be protected. British naval air strength is much less than half that of the United States, with which country there is a nominal parity in other classes ; and it is only a little more than half that of Japan, although as a whole the Japanese Navy, under the Washington Treaty, has a ratio of 60 per cent. of those of Britain and the U.S.A., and even when abrogating the Treaty the Japanese never claimed more than the right to equality. The Fleet Air Arm, therefore, and its associated shore-based aircraft, would have to be more than doubled before it could be held to be as strong as the needs of the Royal Navy demand, judging by the standard set by other Powers. This is perhaps the most disquieting feature of a review of relative naval strength at the present time.

G. H. HURFORD.

CHAPTER IV.

The End of Disarmament.

Peishetairus : Come, what d'ye see ?
Hoopoe Bird : The clouds and sky—that's all.
Peishetairus : Well, that's the pole, so called. From that position you'll command mankind and when the Gods offend you, you'll blockade 'em.
Aristophanes, " The Birds." (Frere.)

The end of 1934 saw the end of the Disarmament Conference. Article VIII of the Covenant promising the limitation of armaments had failed to materialise, while the two principal measures of actual disarmament, the Washington Treaty of 1922 and the London Treaty of 1930, had been negotiated outside it on the plane of old diplomacy. The former was approaching its period of determination, and on December 22, 1934, Japan notified her intention to determine it. It therefore definitely terminates on December 31, 1936, the same date as that of the Treaty of London.*

The New Year was to be an eventful one in the sphere of foreign policy. On January 7 an agreement was signed at Rome between France and Italy settling all outstanding differences and including the recognition by France of Italy's economic interests in Abyssinia —the prologue to Mussolini's further settlement with the Negus. To a note from Italy to Great Britain as to the harmonious development of their interests in Abyssinia the latter replied that the matter required careful consideration.

Great Britain's principal efforts at the time were directed towards the framing of a general agreement on the limitation of armaments to take the place of the disarmament clauses of the Treaty of Versailles and to be discussed with Germany on a basis of equality. France, however, was strongly opposed to any rearmament on Germany's part in the absence of definite and binding guarantees of assistance from other Powers. Unable to obtain further guarantees from Great Britain she was planning in 1934 an Eastern Locarno, in the form of a plan of mutual assistance, embracing Russia, Germany, Poland, Czecho-Slovakia and the Baltic States. Great Britain stood outside it in an attitude of approval, holding fast to the policy of " no further commitments." †

In conversations with Great Britain, Germany's equality in status and in actual armaments was accepted in principle, France insisting, however, that any revision must be effected through the agency of the League and Article XIX of the Covenant. France believing Germany to be rearming, had extended in February, 1934, the period of military service from one year to two.

On February 3, 1935, Germany issued an important statement, proclaiming as the basis of her policy in the future: (*a*) military equality; (*b*) a ten years' Non-Aggression Pact; (*c*) acceptance of the French frontiers: and (*d*) a pledge not to interfere with Austria. Great Britain, France and Italy issued an equally important statement of their policy on the same day. Their aim was a general settlement to be attained by way of a revision of the Versailles Treaty, to be based on a series of pacts, and specially air pacts, for the provision of immediate assistance in the case of an unprovoked attack. Sir John Simon the same day (February 3) broadcast the advantages of a Five-Power Air Pact to include Great Britain, France, Germany, Italy and Belgium for mutual air defence, in which Great Britain's commitments were not to extend beyond the terms of Locarno (i.e. the security of the Franco-German frontier). This was followed on February 15 by a proposal to the German Government for a meeting to discuss the issues of security, armaments, the return of Germany to the League and the possible terms of an Air Pact.

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* The Treaty of London, Article 23.

† Sir John Simon, House of Commons, July 13, 1934.

France by that time had been able to convince Great Britain that Germany was already arming, for the Government Statement of Policy * issued on March 4, stated that we were taking risks in the reduction of armaments and if German rearmament continued our anxieties would be increased. This expression of opinion had a chilling effect on Germany, and Herr Hitler caught a cold which necessitated the postponement of Sir John Simon's impending visit to Berlin. The weakness of our fighting forces was painfully evident, and on March 11, in an important debate on defence, the Government announced its decision to modernise our organisation for defence. On March 14, the First Lord (Sir Bolton Eyres Monsell), in a speech which made a deep impression, emphasised the needs of the Navy, stating that in the way of disarmament he would have liked to see the abolition of submarines, if other Powers had been able to agree to it.

On March 16 a broadcast came resounding through the air from the Berlin Stadium. It was Hitler's historic declaration. Germany repudiated the disarmament clauses of the Versailles Treaty, restored compulsory service, and established an Army of 12 army corps, or 500,000 men. This momentous announcement, received in Germany with wild demonstrations of delight, cut right across the Three Powers' declaration of February 3. It was at this time of extreme tension that the Secretary-General of the League issued a formal request from Abyssinia for an investigation, under Article XV, of her differences with Italy.

Dr. Goebbel's stentorian announcement shattered the idea of a general *rapprochement* with Germany and carried Sir John Simon and Mr. Eden to Berlin a week later (March 24) to discuss with Herr Hitler the new trend of affairs. Herr Hitler's demands possessed the virtue of precision. He wanted a Navy 35 per cent. that of the British; an Army of 550,000; air parity with Great Britain and France, and an air pact with the Locarno Powers. The discussion was lengthy and by the evening they were all hoarse.

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* Cmd. 4927.

On March 27 Japan's secession from the League became effective. Mr. Eden went on to Moscow and Warsaw, and on April 9 Sir John Simon in the House of Commons gave an account of his round of exploratory visits and once again gave an assurance of no further commitments on the part of Great Britain.* France, greatly perturbed at Germany's open repudiation of the Treaty of Versailles, turned to Russia, and on April 10 announced an agreement with the Soviet Republic for mutual aid against aggression, based on the Covenant of the League. The whole structure of European policy was trembling under the shock, and on April 11 three Prime Ministers, Mr. MacDonald, M. Laval and Signor Mussolini, met at Stresa on Isola Bella to review the new situation. The Conference was based on the Agreement of February 3. France and Italy were waiting expectantly for an exposition of Great Britain's policy in the face of Hitler's trumpet blast. The British Government, however, refrained from any definite declaration of policy, possibly taking the view that the best thing to do after a volcanic eruption is to start clearing up the debris. Mr. MacDonald stated at Stresa that the policy of collective security must be pursued, while France urged that the Three Powers should do something more than register an expression of platonic regret. They must reach a clear decision as to measures. Great Britain thought that any such suggestion called for careful and deliberate study—a rôle which in August was to suffer an ironical reversal. The Stresa Conference, the third milestone in 1935, ended on April 14 in a joint communiqué. The Three Powers concurred as to the necessity of maintaining the independence and integrity of Austria and agreed to continue studying the possibility of a Western Air Pact. With regard to disarmament, the unilateral repudiation of the Versailles Treaty by the German Government had undermined public confidence, but they remained anxious to join in any practicable effort towards the limitation of armaments. They agreed to recommend the consideration of the revision of the Treaties of Peace. The Three Powers, whose object was the maintenance of peace within the framework of the League, found themselves entirely agreed in opposing by all practicable means the unilateral repudiation of treaties, which might endanger the peace of Europe.†

The French memorandum to the League of Nations went out the same day. It stated that in December, 1934, the German Air Minister had refused to admit that the Reich possessed more than a few experimental craft; yet in March, 1935, Herr Hitler could say that Germany had attained parity with Great Britain in the air. The rearmament constituted a definite infringement of the Peace Treaty. The Government of the Reich had deliberately destroyed one of the bases of its collaboration with Geneva and had seriously compromised the negotiations for disarmament. It was the duty of the Council of the League to pronounce upon the situation and take decisions to meet it, and to safeguard the future.

The Council met on April 16 and passed a resolution declaring that Germany had failed in her obligation to respect treaties; it invited the governments concerned in the plan of February 3 to continue its study, and finally appointed a Committee to consider measures to assure collective security and to define in particular what economic and financial measures were possible of application in such cases.

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* *The Times*, April 10.

† Text in *The Times*, April 15.

Germany's action must have shattered the policy of those who were favourable to her claims and desired to see her co-operate in a general settlement. There is something, however, to be said for her. She had, without doubt, infringed the Treaty, but the other signatories had made no attempt to implement Article XIX (Revision of Treaties) * and Article VIII on Disarmament had remained almost equally void. With both these articles a dead letter, any attempt to furbish up and enforce Article XVI (on Sanctions) in the face of an armed Germany could only have resulted in dangerous strain and friction, ending probably in war. Germany's rearmament had to be accepted.

By April 9 it was known that Germany had ordered 12 submarines, though under the Versailles Treaty (Article 181) she was forbidden to have any. These events compelled a new orientation, and on May 2 the Prime Minister (Mr. MacDonald) announced in the House of Commons that we could not tolerate in the air a force inferior to Germany. M. Laval was in Moscow a little later (May 14) discussing with M. Stalin the possibility of an Eastern Pact. The Abyssinian question was then well above the horizon and was beginning to look ominous. The Conciliation Committee had met, but was making little progress.

On May 21 Herr Hitler made an important speech. Germany could not return to the League; the other Powers had not disarmed; she adhered to Locarno and was ready to take part in any system of collective co-operation in conjunction with Treaty revision; she was ready to supplement Locarno with an air agreement; she recognised the vital importance of sea power to the British Empire and was ready to agree to any limitation of the calibre of naval guns or the size of warships and to the abolition of submarines; she was in favour of the prohibition of bombing outside battle zones and was ready to agree to the abolition of tanks and heavy artillery—a series of proposals which, it must be admitted, seemed to provide a basis comprehensive enough for some sort of agreement.

Mr. Baldwin made an equally important speech the next day (May 22). Great Britain must strengthen her air defence; in view of the marked deterioration in the international situation a re-equipment of the defence forces was necessary; a new air programme must be undertaken. The Air Force was to be increased to 1,500 first line aircraft (compared with 580 at that date). The rearming of Germany gave a powerful impetus to the idea of collective security, an issue on which a sharp cleavage of opinion was beginning to show itself. Lord Lothian thought that the new theory of collective security was simply a dangerously misleading name for a military alliance the effect of which would be to turn every local dispute into a world

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* See Lord Lothian, House of Lords, May 1.

war.* His words were to come ominously near the truth a few months later.

On June 4 naval talks began in London, in which Germany presented a clear proposal for 35 per cent. of British warship tonnage. On the same day Mr. MacDonald resigned the Premiership, to be succeeded by Mr. Baldwin. Sir John Simon became Home Secretary; Sir Samuel Hoare, Secretary of State for Foreign Affairs; and Mr. Anthony Eden, Minister for the League of Nations. Thus was a new Ministry established to emphasise the importance which H.M. Government attached to the League. It would appear that by June the policy of a general settlement and no further commitments had been superseded by that of collective security.

The latter policy may have found a measure of support in what is called the Peace Ballot whose results were made known on June 27 at the Albert Hall. It possessed all the demerits of a piece of propaganda. The title implied that the question was one of Peace or War and the methods of collecting the votes were open to grave objection.† It was said to have polled 11,087,660 votes (about 36 per cent. of the electorate), but as there were no penalties for invalid voting and apparently no really effective machinery for ensuring valid voting in a ballot which seems to have been going on for six months, it would be difficult to say whether it did or not. There can be little doubt that many of the voters were persuaded that they were voting on the main issue of Peace versus War and gave the answer that everybody would give if asked to choose between them. In support of military sanctions 6,506,777 votes are said to have been polled representing about 20 per cent. of the electorate.

An Anglo-German Naval Agreement ‡ was announced on June 18. The total tonnage of the German Fleet was not to exceed 35 per cent. of the aggregate British forces; Germany was to have the right to possess submarine tonnage equal to that of Great Britain but would undertake not to exceed 45 per cent. Germany was prepared to adhere to Part IV of the London Treaty of 1930 (i.e. not to torpedo merchant vessels at sight). French opinion was considerably incensed by this agreement, which was regarded as a blow at the unity announced at Stresa.§ How could Great Britain negotiate alone for Germany's release from the Treaty of Versailles? It was, however, not a question of releasing Germany from the Treaty; she had released herself on March 16. It was not a question of permitting her to build. It was a question of limiting what she intended to build || and of facilitating a general agreement in naval limitation.

Mr. Eden visited Paris and Rome on June 21 to explain the agreement. At Paris there was a "frank explanation." The Abyssinian question was then beginning to overshadow everything

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* Lord Lothian, Lincolns Inn, *The Times*, May 29.

† Peace Ballot, by Dame Adelaide Livingstone, pp. 20, 28. See the Prime Minister's remarks on the questionnaire, *The Times*, July 24.

‡ Cmd. 4930, the text of which will be found elsewhere.

§ "Pertinax" in *Echo de Paris*, June 18.

|| See First Lord, Sir Bolton Eyres Monsell, in House of Commons, *The Times*, June 22.

else and at Rome was discussed "with the greatest frankness." The British suggestion of Italy being given the right to build a railway from Eritrea to Italian Somaliland was not acceptable to Signor Mussolini, who made some pointed remarks on the decline of British naval power, effectually waking Great Britain from her dream of disarmament.

The latter portion of the year 1935 was fully taken up with the question of Italy and Abyssinia, which soon occupied the centre of the arena, dislocating the whole course of disarmament discussions and previous polity. British public opinion was deeply stirred, while France, more hard-headed, was inclined to regard the peace of Europe as more important than a border war in Africa. A Three-Power talk between Great Britain, France and Italy in Paris to try to discover some basis of agreement (August 14–18) proved unfortunately abortive. It was too late for Mussolini to turn back and the proposals presented by France and Great Britain to Italy received scant consideration. A crisis supervened. On August 21, Cabinet ministers were hurrying back to London and the Opposition leaders were being summoned to Downing Street. There commenced a tug-of-war in the Press between the pacifists calling for military sanctions and the exponents of a more level-headed policy. The end of August saw the deeper levels of public opinion profoundly stirred—deep calling unto deep,* in realisation of the fact that military sanctions are only another name for war and that British policy was now perilously close to it.

The Council of the League met and on September 11 in the Assembly Sir Samuel Hoare spoke of "steady and collective resistance to all acts of unprovoked aggression" carefully avoiding any use of the word "sanctions." The booms were in place at Gibraltar, and British battle cruisers were on the move, which roused great indignation in Italy, whose people still remembered that she was the only country to stand by Great Britain at the time of the South African war, contending too that in January, when the question of Abyssinia was raised, Great Britain had given no warning of the strong attitude she was later to take up. On September 20 the French Ambassador in Rome was closeted with Signor Mussolini, urging the cause of peace, and Sir Eric Drummond was able to give a satisfactory explanation for the movements of British war vessels.

Hostilities broke out between Italy and Abyssinia on October 3, and the next day Signor Grandi in London, explaining that Mussolini was desirous of avoiding any step which might lead to an extension of the conflict, suggested a simultaneous and parallel cancellation of precautionary measures undertaken to meet a danger which did not exist. In the French Press it was stated that any French participation in military sanctions was absolutely ruled out by the Council of Ministers held that day (October 4). The situation was greatly eased by the Prime Minister's announcement that the Government had no intention of taking isolated action.†

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* Lord Hardinge, *The Times*, August 27; Mr. L. S. Amery, October 4; Lord William Cecil, *Daily Mail*, August 19.

† Mr. Baldwin at Bournemouth, *The Times*, October 5.

The question of applying sanctions had raised certain subtle points of distinction between (*a*) precautionary measures taken to meet possible retaliation arising out of a state of tension and (*b*) measures appertaining to military sanctions under the League. On October 2 Great Britain asked France if the British Navy could expect French assistance if attacked,* as the Covenant omitted any provision for assistance before the aggressor had been designated. The French in their reply expressed the opinion that the question could not be limited only to naval contingencies in the Mediterranean, but must apply reciprocally to attacks on land, by sea or in the air and in the case of nations not belonging to the League.†

On October 15 Mr. Baldwin, receiving a deputation introduced by Mr. L. S. Amery, M.P. (formerly First Lord of the Admiralty), stated that the Government did not contemplate military sanctions, but that there was no complete certainty that other actions would not lead to warlike action on Italy's part.‡

The French Government replied about October 18 that France would be solid on Paragraph 3 of Article XVI,§ but apparently there remained some doubt as to whether the British Fleet could be regarded as an agent of the League or whether hostile action by Italy would confer on the precautionary measures taken independently by one nation the character of collective sanctions. In Geneva it had been assumed that the energetic advocacy of Article XVI involved the corollary that defensive precautions taken by any single nation would bespeak and involve the assistance of all members of the League. This view was much less acceptable in Paris when translated into the concrete terms of British war vessels using French bases before any policy of military sanctions had even been proposed.||

The point is of supreme interest as demonstrating a difficulty likely to arise in the course of collective action.

Germany's open repudiation of the Treaty of Versailles had strengthened the arguments of those whose eyes were turned to Geneva, and there followed a readjustment of aims and methods. Collective security became the dominant policy, a conception supported by a body of opinion which interprets it in the sense of every nation bearing an equal or proportionate share of any fighting to be done. Its critics contend that, though the theory may be sound, the reality is a long way off.

They point out that any system of collective security must conform to certain principles of structural equilibrium. Again, if its main object is the maintenance of peace, then the fundamental principle follows that the forces available to impose peace must be so decisively superior as either by their mere menace to preclude hostilities or at least to ensure that any contest shall be short and

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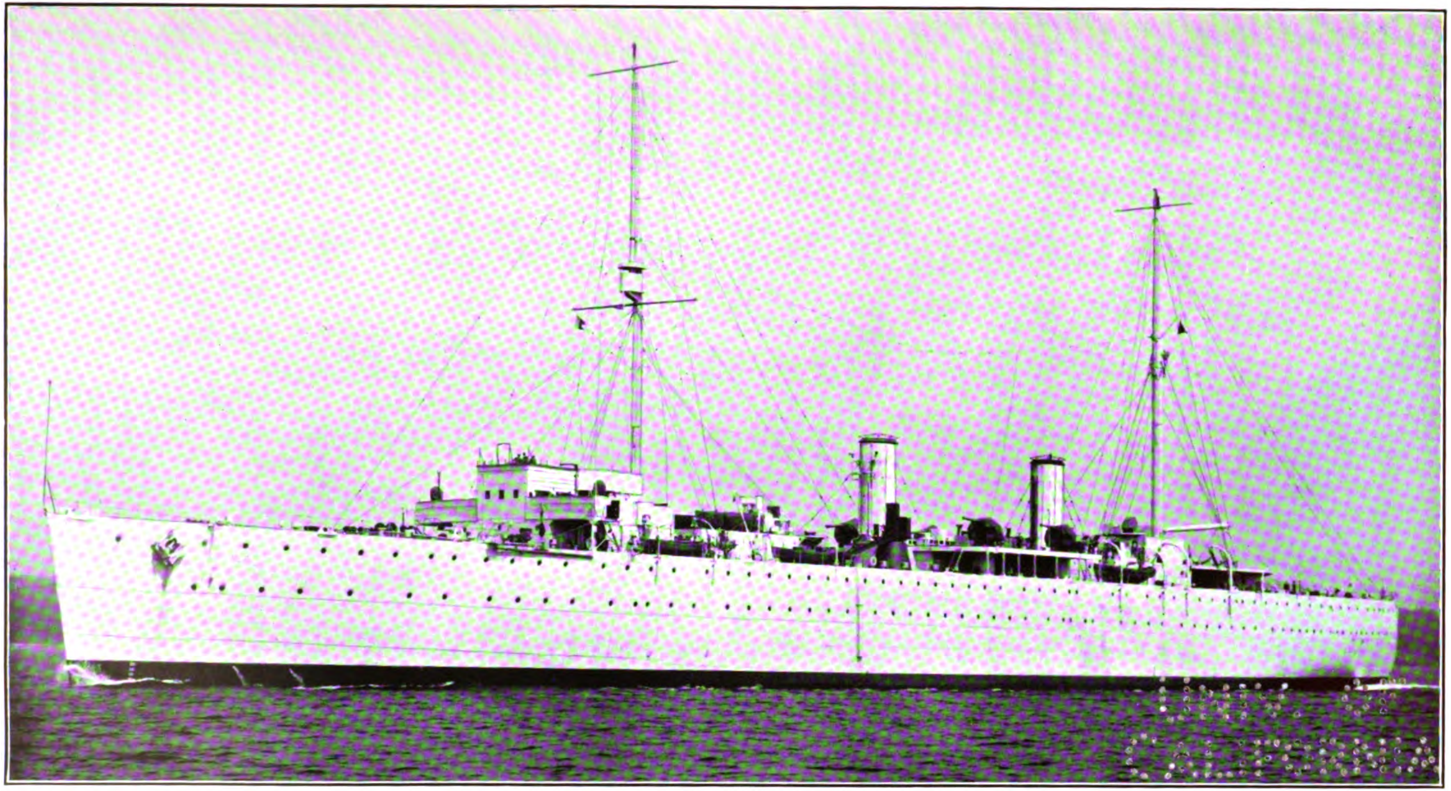
* According to the French Press, "in view of the possibility of Malta being untenable could the British Fleet use Marseilles or Bizerta?"

† *The Times*, October 7.

‡ *Daily Express*, October 16.

§ I.e. "mutually support one another in the financial and economic measures . . . and . . . in resisting any special measures aimed at one of their number."

|| *Echo de Paris*, "Pertinax," October 19.



H.M. DESTROYER DEPOT SHIP WOOLWICH.

Commissioned for Service, June 28, 1935.

(By courtesy of the builders, the Fairfield Shipbuilding and Engineering Company, Ltd.)

decisive. Any other conditions must mean a protracted war to end war—and the war after that.

There is logic in the contention, for let us suppose for instance six Powers, each of them possessing equally strong coefficients of fighting strength: viz. (*a*) navy; (*b*) army; (*c*) air force, each of these headings including such factors as population, obligations for service, traditions, and corollary industrial resources; (*d*) economic strength, raw materials, transport, industrial resources in war requirements, food grown at home; (*e*) geographical position for offence and defence. Then, supposing each of these six Powers could muster an army of 1,000,000, a navy of 10 battleships, and an air force of 1,000 planes, any one of them inclined to break the peace could be threatened by a force five times as strong. The system would be more or less in equilibrium, on the assumption of course that there existed an effective procedure for setting the collective forces in motion. It is unfortunately not possible to say that the League rests on any such foundation. It musters only four great Powers—Great Britain, France, Russia and Italy, all of them varying greatly in the main elements of fighting strength. Great Britain, for instance, possesses a comparatively small army unsupported by any system of general military training, while three great Powers, the United States, Japan and Germany, are outside the League, the first holding the keys of most material resources in her hands.

It is argued, therefore, that no sound and stable structure of collective security can be built on the foundation of the League as at present constituted; and that any system of military sanctions must press inequitably on the very few Powers who can enforce such sanctions (any naval work for instance would fall almost entirely on Great Britain and France), and any system of economic sanctions must result in very unequal strains. In the case, too, of Great Britain, the British Commonwealth rests on a system of Imperial defence, which a system of continental collective security will dislocate and afflict with a duality of aim, for the requirements of such a system may easily conflict with those of Imperial defence, as has happened recently in the case of Malta, which has been swept into a vortex of dangerous contingencies. Imperial defence and European collective security may be compared to two circles revolving round different centres, almost bound to conflict with one another unless the system of collective security can become general and world-wide, embracing the United States, Germany and Japan. Again it is argued that the requirements of the two systems are different. The primary requirements for Imperial defence are a strong navy, a strong air force and a moderate army capable of expansion by the Dominions. Collective security on the other hand seems to require a large army, involving a system of conscription and general military training which we have not got. It is here, too, that a further weakness presents itself, for with remarkable inconsistency the fiercest advocates of collective security are usually the most fervent opponents of military training. The people who were shouting most loudly for disarmament in 1933 are the very people most vociferous for military sanctions in 1935. The Jingo of the past did at least, before shouting for the Empire, make sure he had the ships, the men and the money too, but the internationalist Jingo demands disarmament and war almost in the same breath. Viscount Cecil, a strong advocate of disarmament, is equally vehement for the cutting of Italy's communications by means of a blockade, "which would," he stated, "be *exceedingly disagreeable* to Italy but need not *lead to serious fighting* unless they should madly decide *to go to war with those who were enforcing these measures*." * It was apparently only the sound common sense of the National Government which put a firm estoppel on such a policy. Blockade and the interception of contraband are rights belonging to belligerents alone; the operations appertaining to them are belligerent activities and as such are acts of war and must undoubtedly lead to war. This remains true, though the events of the year 1935 last demonstrated the possibility of considerable economic pressure being exerted on any Power, not armed with great resources, that goes to war in defiance of world opinion.†

The attitude of the United States is one of the deciding factors. It has been not unfavourable to Geneva. The United States, though outside the League, has adopted a modification of the old conception of neutrality, presumably based on the State Department Report on Neutrality which was ready on April 1, 1935. The Senate is evidently inclined to waive the old rights of neutrality in certain circumstances and is not inclined to take any action prejudicial to collective action, instigated not so much by friendship to the League as by a determination to keep out of European quarrels. It is evidently in accordance with these principles that the President pronounced an embargo on the export of arms and munitions of war‡ and a prohibition on American citizens travelling in belligerent ships, two measures which might be regarded as the forerunners of a new interpretation of neutrality exercising influence on the future.

Unfortunately, neither disarmament nor new rules of neutrality will in themselves abolish war. Great Britain has learnt in the last fifteen years that armaments are merely the symptoms of a malady. She has reduced her Navy to one-third of its old strength, her Territorials have dwindled from 249,000 to 130,000, her Air Force from 3,300 to 850. "It was done," as Cromwell said, "in simplicity, but the issue has not borne out the honesty of the design." § We have been forced to abandon the policy. "We can pursue this path no longer." || It has become a matter of urgency to strengthen our Navy and Air Force and modernise our Army. The disarmed Power lies at the mercy of circumstances. "If," said Goschen in 1899, "you think that war is simply an absurd impossibility, if you think that you can have peace without power . . . then I admit

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* Viscount Cecil at Church Congress, October 10, 1935 (*The Times*, October 11). Italics not in original report.

† See Chapter V on Sanctions.

‡ Became operative October 26.

§ Cromwell of the Little Parliament, 1653.

|| Mr. Baldwin at Bournemouth, October 4; Mr. Neville Chamberlain, Guildhall, October 1; Lord Hailsham, Sheffield, October 9.

that these estimates are a crime. If on the other hand it is not so, then these estimates are a necessity and they are simply the embodiment of the will of a peace-loving but determined people." The words that Goschen spoke might be uttered now without altering a single syllable. The events of the early part of last year demonstrate clearly that Great Britain must uphold her old position at sea and establish a new position in the air, so as to maintain a policy based on assured strength, orientated towards the Dominions, ready to seek peace and ensue it.

The end of the year has doubly confirmed these conclusions. When oil sanctions were proposed in the Co-ordination Committee at Geneva on November 2, the French pointed out that to render naval assistance they would have to mobilise the fleet and requested that Great Britain should avoid any aggravation of the situation.*

Sanctions came into force on November 18 and by the end of the month oil had become a burning question, with the League of Nations Union flaming with fervour; while a distinguished professor was anxious to see the dispatch of "a gunboat of *some sort* from every member of the League *that had one*." †

On December 8 Sir Samuel Hoare was in Paris with M. Laval seeking the formula of a peace settlement in which Italy was to be given a considerable slice of Abyssinian territory. The gist of these terms leaked out in Paris and on December 9 the Cabinet gave them its approval, which might be regarded merely as an approval to present them to the League for a final decision. Unfortunately, letters to the British Minister in Abyssinia urging their acceptance seemed to constitute a distinct reversal of policy. Mr. Eden presented these terms to the League on December 12, pointing out that they were "neither definitive nor sacrosanct." The text was issued at Geneva on Friday the 13th.‡ A volume of protest arose and swelled ominously into a political crisis. On December 18 Sir Samuel Hoare resigned. In a debate on a motion of censure on December 19 he stated that his primary object had been to prevent an isolated war between Great Britain and Italy and to save Europe from a general conflagration. "The League was unorganised, unready for war but entirely ready to leave any conscientious member to bear the full brunt of war." "No other Power in Europe had moved a ship, a machine or a man." The Government on division secured a majority of 282. On December 23 Mr. Eden became Secretary of State for Foreign Affairs. On January 19, 1936, the Council of the League met under the shadow of M. Laval's impending resignation and of Japan's withdrawal from the Naval Conference. The oil question was flaming less furiously, and on January 23 the Committee of 18 appointed experts to go into it, M. Titulescu, representing one of the Powers which had not moved a ship or a man, being very insistent that this should be regarded merely as a technical step towards enforcement.

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* French Press, November 3.

† *The Times*, December 6.

‡ *The Times*, December 14.

The question really resolves itself to this—Shall a number of petty States, which have no navy nor army to speak of, dictate measures, the whole brunt of which must fall on Great Britain and France ?

THE NAVAL CONFERENCE.

The Conference, attended by Great Britain, the United States, Japan, France, and Italy, was opened on December 9 by Mr. Baldwin. In the London Treaty of 1930, dealing with cruisers, destroyers and submarines, France and Italy had not been able to consent to any limitation, France, indeed, having at present some 30 destroyers of over 2,000 tons, which are really small cruisers. The British delegation included Lord Monsell, First Lord of the Admiralty, and Admiral of the Fleet Sir Ernle Chatfield, First Sea Lord and Chief of the Naval Staff.

The proposals presented by the various Powers were briefly as follows :—

Great Britain . . Limitation of total tonnage either in terms of ship categories or of global tonnage.
Quantitative limitation of tonnage of ships and calibre of guns.
Announcement of building programmes for a period of 5 years.
Total abolition of submarines or a limitation of their size.
United States . . Tonnage reduction of 20 per cent.
Retention of ratio system with a lower level all round.
Reduction, not increase, of armaments.
Japan asked for the abolition of the ratio limit (5 : 5 : 3) ; the abolition of "offensive" vessels such as battleships and aircraft carriers.
France was in favour of limitation by global tonnage and of smaller ships, but desired a free hand in light surface craft and submarines.
Italy asked for equality of tonnage with France.

Both France and Italy were ready to adhere to the rules in the London Treaty governing the treatment of merchant vessels by submarines. Japan was strongly opposed to any ratio and pressed strongly for a " common upper limit," in other words, a maximum applicable to all Powers. This proposal clashed with the conception of " equality of security."

On December 16 its consideration was postponed and the British proposed that each should adopt the minimum strength adequate for security and declare the limit above which it would not build, a step which would get rid of harmful secrecy and suspicion. Japan's rigid adherence to the conception of a " common upper limit " led on January 16 to an illuminating speech by Lord Monsell. The Japanese demand for equality of fleets in the area of contact was not in British opinion a sound standard ; sources of supply, length and vulnerability of communication must be taken into consideration ; a country defending itself in or near its own territory has an inherent advantage over an attacking force, while a fleet operating at a great distance from its home bases suffers a heavy handicap. Mr. Norman Davis, the United States delegate, was in general agreement, and on January 16 Japan decided to withdraw from the Conference.

On January 29, the First Committee met, when Lord Monsell put forward as a basis for discussion—

Capital ships	**limit of 35,000 tons and 14-in. guns with a possible reduction of 3,000 or 2,000 tons.**
Aircraft Carriers	**22,000 tons and 6·1-in. guns.**
A-Class Cruisers	**No more to be built.**
B-Class Cruisers	**7,500 to 8,000 tons with 6·1-in. guns.**
Submarines	**2,000 tons and 5·1-in. guns.**

These figures for qualitative limitation were referred to a technical committee.

It must be regarded as very unfortunate that Great Britain has not been able to persuade other Powers to reduce the battleship to 25,000 tons with 12-in. guns, the limit suggested by her in the Disarmament Conference of 1932, which would mean an immense economy to all countries. Its rejection only proves how strong still is the spirit of international bitterness and rivalry and with the whole current of affairs setting towards armaments, it is almost hopeless to think that any big measure of limitation can be achieved.

Through the haze of sentimental inspiration can be seen grimly lowering the remorseless rocks of international rivalry. Only one leading light shines clearly out—to look to and strengthen our own defences.

It was on this troublous sea that the death of H.M. King George shed a momentary ray of peace—a peace based on his own simplicity and sincerity of heart with a lesson in it for a sorrowing nation and a sorrowful world.

Alfred C. Dewar,
Captain, R.N.

CHAPTER V.

SANCTIONS. THE NAVAL ASPECT.

THE word "sanctions" has been much misused of late. Indeed, it is not too much to say that, until from being a somewhat vague and academic expression it came to be descriptive of the actual proceedings of the majority of States which are Members of the League of Nations, few of the general public had any very clear idea of what it meant. Even now it seems doubtful whether the Italian government, for instance, up to November at least, believed that the rest of the world had yet grasped the actual meaning of the word or the true nature of the actions then being taken which it describes; for that government was reported to have warned the governments of States which were already enforcing certain embargoes as sanctions, that it would regard their extension to include oil as "an unfriendly act." Various prominent British publicists, too, are reported as reiterating as an irrefutable dictum that "sanctions mean war." Others have urged the use, as sanctions, of certain measures which are clearly illegitimate, if not impracticable. It is therefore a matter of particular interest to the fighting Services to examine the real meaning of the word, and the real nature of the actions which it describes.

Sanctions, in the legal sense, are measures prescribed or taken in support of law. Everybody is familiar with the sanctions of the law of the land in which he lives, even if he has never thought of them under that name. If he drives a motor-car without taking the precaution of renewing his driving licence, he knows he is liable to be charged before a magistrate, and if the charge is proved, to be fined; more serious breaches of the law are visited with imprisonment; offences against the criminal law with penal servitude. In civil actions, the pronouncements of the courts of law are enforced by judicial order, disregard of which renders an offender again liable to fine or imprisonment. All these measures are enforced by the police and prison services of the State—bodies which exist for the preservation and enforcement of "law and order." All of them are comprised under the general head of Sanctions of the Law.

Conditions in the international sphere are rather different. International law is not a code or a body of statutes, to breaches of which penalties are attached. It is rather a body of rules or principles to which nations in their dealings with one another subscribe voluntarily, either from conviction of the justice of them or for reasons of expediency. International law, as understood up to 1919, had no sanctions, except that the breach of it by one State might induce or provoke other States to make war upon the offender. But the danger of war, though at times it might operate as the only sanction of international law, could not be specifically so regarded. The most law-abiding of States were not free from it, since wars had frequently arisen from aggression, lust of conquest, clash of policies, or other causes in which the breach of international law had no part.

States in their dealings with one another are, however, not governed solely by international law in the above sense; they are also governed by treaties, pacts, or agreements, which may be made between two parties only, or may be general instruments to which many States subscribe. In such agreements it is possible to include provisions as to the action that shall or may be taken by the other parties if one of them should commit any infraction of the undertakings they contain. Those provisions may be merely to the effect that the infraction brings the treaties to an end; on the other hand, they may authorise measures designed to compel the recalcitrant party to conform to his obligations, and to impose definite disabilities on him so long as he refuses to do so. The latter measures may be properly described as sanctions; for the treaty which prescribes them, if it sufficiently approaches universality in the number of its signatories, acquires the character more of international law than of a simple agreement. Such treaties are the Covenant of the League of Nations and the Briand-Kellogg Pact.

In the international sphere there is no body or authority corresponding to the police forces within a State. Various proposals for establishing such a body have been made from time to time, and are urged upon the world with much enthusiasm by various unofficial organisations such as the New Commonwealth. But the difficulties in the way of such an international organisation are so formidable as to be, in the judgment of many, insuperable; whether they are so or not, there is no sign that the world in general is in the least likely to adopt the system at present. The world to-day is organised as a body of independent sovereign States, no one of which acknowledges the authority over its actions of any body outside itself, or any limitation on its freedom of action beyond the engagements into which it has itself voluntarily entered. If the signatories of a general agreement accept sanctions as a part of it, there is no impartial authority or body to which they can delegate the duty of applying those sanctions. Each party accepts his share of that duty himself, and at the same time accepts the prospect that sanctions will be applied by the other parties against him, if he himself should be guilty of a breach of the agreement.

The whole aim and object of the Covenant of the League of Nations, in the intentions of those who created it, was, so far as seemed practicable in an imperfect world, to prevent war. For that purpose it not only provided comprehensive machinery for investigation, conciliation, or judicial settlement of international disputes; it recognised that such measures might possibly be insufficient to prevent war in some cases, and it therefore also prescribed the sanctions that were to be used against any signatory State which might break its engagements to the length of making war, in order to bring the war to an end and compel observance by that State of the obligations it had assumed.

The most obvious sanction for such an infraction of the Covenant would perhaps have been the threat that all other Members of the League would combine to restrain a war-making State by force. But those who threaten action must be prepared to make good their threats if need be; and in this case, if they did, the result would be to extend war rather than to extinguish it. The League would have stultified itself if it had adopted any project which might involve action so contrary to its basic principles; and, moreover, to do so would have been merely to perpetuate the former imperfections of the world order which it was the object of the League to better. The League had therefore to devise some means of coercing a war-making State which should not themselves amount to war but should yet be effective to bring war to an end. This it did in the universal economic boycott which is prescribed in Article XVI of the Covenant as follows:—

Article XVI.

Should any Member of the League resort to war in disregard of its covenants under Articles 12, 13, or 15, it shall *ipso facto* be deemed to have committed an act of war against all other Members of the League, which hereby undertake immediately to subject it to the severance of all trade or financial relations, the prohibition of all intercourse between their nationals and the nationals of the Covenant-breaking State, and the prevention of all financial, commercial or personal intercourse between the nationals of the Covenant-breaking State and the nationals of any other State, whether a Member of the League or not.

It shall be the duty of the Council in such case to recommend to the several Governments concerned what effective military, naval or air force the Members of the League shall severally contribute to the armed forces to be used to protect the Covenants of the League.

The Members of the League agree, further, that they will mutually support one another in the financial and economic measures which are taken under this Article, in order to minimise the loss and inconvenience resulting from the above measures, and that they will mutually support one another in resisting any special measures aimed at one of their number by the Covenant-breaking State, and that they will take the necessary steps to afford passage through their territory to the forces of any of the Members of the League which are co-operating to protect the Covenants of the League. . . .

There are several observations to be made upon this Article. In the first place, it will be observed that the actions it prescribes are of two different and distinct natures: one internal, applied by each State within its own borders and jurisdiction; the other external, involving coercive action outside the normal jurisdiction of the States taking it. Prohibition of intercourse is, for the States enforcing it on its own subjects, merely a matter of "municipal" action, enforceable by the police, Customs, or immigration officers. On the other hand, prevention of intercourse with the offending State, by either those who evade the control of the above-mentioned authorities, or by those who are not subject to it—e.g. the nationals of other States, particularly non-members of the League—is enforceable only by naval action.

In the second place, it will be observed that the action prescribed by Article XVI is mandatory on the Members of the League, not merely permissive. In this connection, it must be remembered that the League, as conceived by its creators, was a much more comprehensive body than the League as it exists to-day. Its creators envisaged it as comprising all the powerful and important States of the world, including, after a due interval, the Powers defeated in the Great War. There is little doubt that, when they prescribed the prevention of intercourse with "the nationals of all other States, whether Members of the League or not," the latter, in their view, would only be the weaker and more backward States which had not yet qualified, by their standard of civilisation, for membership of the League; and their coercion, in the cause of peace and justice, by an all-powerful League, would present little difficulty.

But the ideal League of its founders never became a reality. The United States of America never became a Member at all, and of late years Japan has left the League, as has a rearmed Germany —i.e. three out of the seven Great Powers are outside the League instead of within it. Even if the offending State, against which occasion arises for Article XVI to be applied, is not sufficiently powerful itself to resist the League's coercive measures, it may not be possible for League Powers to enforce them fully if any of the non-member Great Powers object, and maintain their right, as neutrals under international law, to continue free intercourse with the State which the League Powers adjudge to be a Covenant-breaker. Thus, the full action which, by the wording of Article XVI, is mandatory upon Members of the League is no longer possible.

It is a legal maxim that the law compels nobody to do the impossible. It is therefore no longer obligatory for the League Powers, when occasion arises for them to put Article XVI into force, to proceed to the full lengths it prescribes. The Article must now, as was pointed out in a speech broadcast on September 2, 1935, by Sir John Fischer Williams, be read as prescribing the maximum action that may be taken. It remains obligatory for the League Powers to do what is reasonably possible as a just and honest interpretation of its provisions, in the light of world conditions as they now exist; but the obligation is no greater than that.

It may be argued that if an Article of the Covenant is no longer capable of being carried out, it should be either cancelled or amended. The argument is sound, and in due course it will, no doubt, be acted upon. But in practice it is not an easy matter to carry through an amendment to the Covenant. Attempts were made some years ago so to rewrite Article XVI as to bring it more into conformity with actual conditions, but the degree of agreement necessary to carry an amendment to the Covenant was not achieved. Since then the League has been too much occupied with other matters, seemingly of more immediate importance, to return to those of which the importance appeared remote; and the amendment of Article XVI has been postponed. It may be that after the present crisis has subsided the League will take up the task of bringing the Article up to date. There should then be available experience of sanctions in actual operation; the League and its Committees should have something more to go upon than the pure theory that alone was available ten years ago.

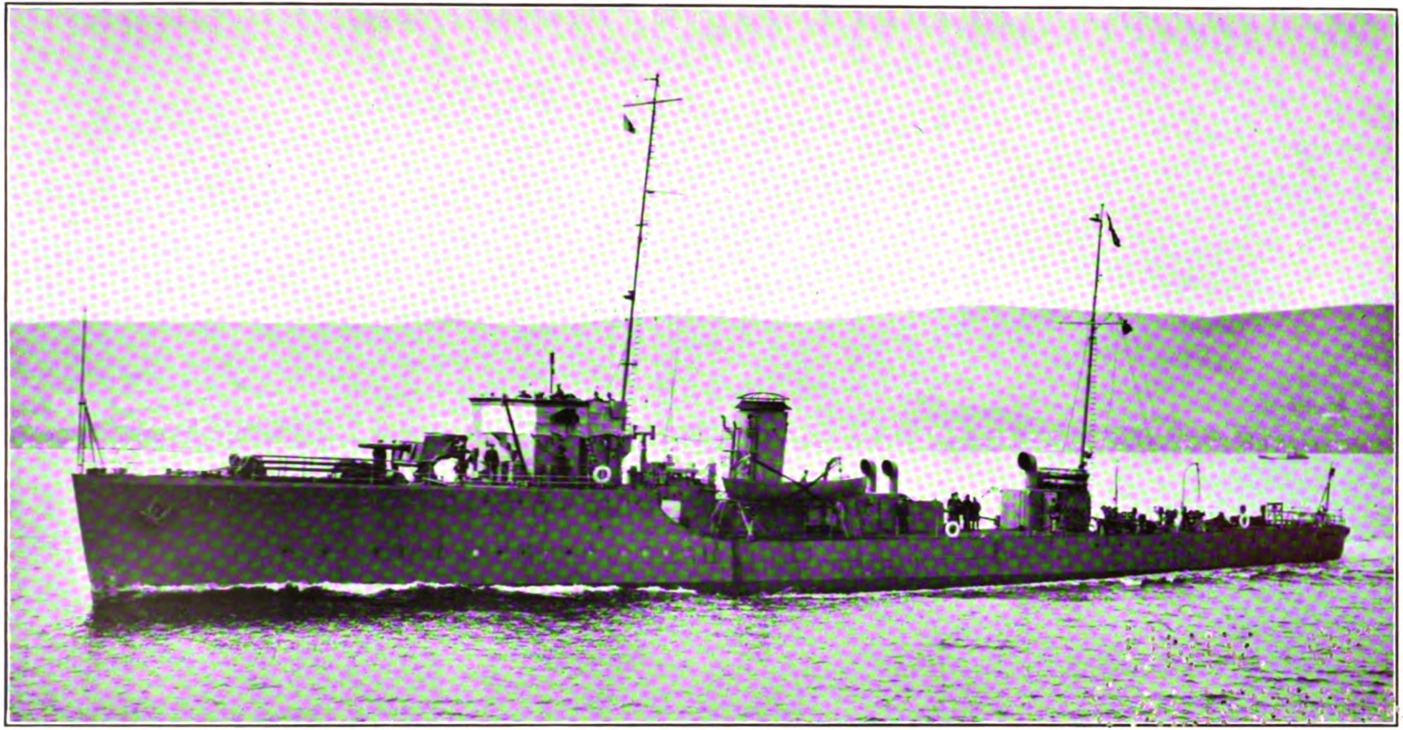
Whether or not it is possible for the League Powers to carry out Article XVI in its entirety, it must be clear in no circumstances can they be justified in going beyond it. Sanctions become applicable against any Power, Member of the League, which by " resorting to war " breaks the solemn engagements it has entered into in subscribing to the Covenant. The justification for their use, by one or more sovereign independent States against another, is that they vindicate the sanctity of solemn international engagements ; that they could not do if the acts done under the guise of sanctions went outside the four corners of the Covenant, the international instrument by which they are supposed to be authorised ; still less if those acts are themselves contrary to other international agreements of equal solemnity and sanctity.

In the light of these general considerations, it is of interest to examine certain concrete proposals that have been seriously advanced in the present crisis between Italy and Abyssinia. Hostilities did not actually begin until October 3, 1935; but from Italian action in pouring troops and war material into Eritrea and Italian Somaliland ever since the Wal-Wal incident in November, 1934, and in resisting the attempts made to resolve the dispute by arbitration or conciliation, it appeared clear much earlier that Italy contemplated the possibility of war, even if not definitely intending it. On June 7, 1935, Mr. Attlee declared in the House of Commons that " Italy ought to be told quite plainly that in the event of attacking Abyssinia she would not have the use of the Suez Canal." How the use of the Canal was to be denied to Italy, he did not specify, but it seems highly probable that he contemplated its closure by the naval, or perhaps military, forces of this country.

This proposal indicates lack not only of clear thought upon the military problem involved, but even of respect for the provisions of the Covenant of the League, either in letter or in spirit. Even if Article XVI is interpreted according to its strict letter—ignoring the limitations, referred to above, imposed by considerations of impossibility—it enjoins the severance of intercourse between the offending State and *other States* only ; it does not authorise the severance of intercourse between the offending State and its own Colonies or outlying possessions. On these grounds alone, the action proposed by Mr. Attlee was outside what is authorised by the Covenant. Apart from that, the Suez Canal Convention, an international instrument no less solemn and no less widely accepted than the Covenant itself, enjoins that the Canal shall be kept free and open to merchant ships and men-of-war of neutrals and belligerents alike, in time of war no less than in time of peace. Its closure would be just as much a breach of international engagements as would " resort to war."

The action proposed by Mr. Attlee amounts, in reality, to direct intervention by the League Powers in the war by interrupting the communications of one of the belligerents ; action which is not only contrary to the letter of the Covenant, but is directly contrary to its spirit. For the League Powers to join directly in the war would be to adopt the action which was deliberately rejected by the framers of the Covenant ; it would be to endeavour to stop the war by extending its scope.

It may be that those who supported the proposal considered it



H.M. COASTAL SLOOP KINGFISHER.

Commissioned for Service, June 18, 1935.

(By courtesy of the builders, the Fairfield Shipbuilding and Engineering Company, Ltd.)

possible, by some unspecified means, to refuse passage to the Canal to Italian ships without resorting to force. There are no means of doing so. There are in the Canal no obstacles to navigation, the passage through which can only be opened by the Canal authorities. Those authorities could, no doubt, refuse the services of their tugs and pilots, but such measures would not deter a determined seaman from taking his ship through the Canal. To do so without the co-operation of the Canal traffic authorities would no doubt involve risk of collision and therefore of blocking the channel; but the Canal authorities would be in the last degree unlikely to do anything that would increase that risk. Confronted with a declaration that a number of Italian ships intended, with or without official co-operation, to pass through the Canal, all they could do would be to leave them a clear passage and not attempt to move any other traffic against them which might involve collision. There is no method, short of forcible compulsion applied to the ships themselves, of preventing passage of particular ships while leaving the Canal free for ordinary traffic. The interruption of traffic between Italy and her East African possessions is a warlike operation, whether it takes place in the Suez Canal or on the high seas.

Being a military operation, the question whether it should be accomplished by action in the Canal or on the high seas is a military problem, to be decided on military grounds. The admiral entrusted with the task of cutting those communications would have to decide where on the line between Italy and Italian Somaliland he would act. He might achieve it by a blockade either of the Italian coast or of the Eritrean and Somali coasts, or he might act at any point between them. But as he would need to ensure the constant freedom of the Canal for the conduct of his own communications—to say nothing of the commerce of the rest of the world which uses it—probably the last place he would choose for his theatre of operations would be the Canal itself. He would realise that his interference with a belligerent's communications, wherever and on whatever high moral grounds it was undertaken, could not be treated by that belligerent as other than a direct intervention in the war, which would undoubtedly involve him in full-scale hostilities. And he would take very good care that the theatre of hostilities should be well removed from one of the most vulnerable points of his own communications—i.e. the Canal. The proposal to close the Suez Canal would seem to be condemned alike on moral, political and military grounds.

It seems probable that the suggestion, seriously made in the House of Commons, that the League Powers, or this country acting on their behalf, should intervene directly in the war in this way is largely responsible for the state of tension which existed for some months between Italy and England. The Italian naval authorities were presumably obliged to take measures to meet what appeared to them to be a definite threat of war from a new enemy; and it may be conjectured that those measures, constituting in their turn a serious threat to the British peace establishment of naval force in the Mediterranean, were the reason for the unobtrusive reinforcement of the Mediterranean Fleet. Fortunately, the British Government were able in time to make it clear that they had no intention of acting on uninstructed and bellicose suggestions made in this country, and while it cannot be said that the tension was entirely relaxed by December, it had already eased to such an extent that the danger of war might be considered, for the time being, in abeyance.

The sanctions which have been actually put into force by the League Powers are strictly within the four corners of the Covenant. In the almost unanimous judgment of the Assembly of the League—Austria, Hungary and Albania alone dissenting—Italy by invading Abyssinia in October " resorted to war in disregard of her covenants," thus bringing into force the obligation on all the Powers concurring in that judgment, to act in accordance with Article XVI. In pursuance of that obligation, the League Powers, without important exception, prohibited their own citizens from exporting arms or war material to Italy, from furnishing financial assistance or facilities to the Italian Government, and from importing goods of any sort from Italy. All these are internal measures only. They furnish no valid excuse for the Italian Government to retaliate by armed force ; for even if there were no Covenant of the League in existence to authorise them, they do not amount to acts of war under any interpretation of international law. They are not " unfriendly acts," but neither are they friendly acts ; they are acts done in accordance with a treaty entered into by Italy as well as the numerous Powers which are performing them.

It was the hope of the League Powers that these measures, while they fell considerably short of the complete boycott of Article XVI, would suffice to render the economic conditions of Italy so difficult that she would be unable, not only to continue the war, but even to endure those conditions if the war were called off. If they so proved, Italy must renounce aggression and submit to a judicial settlement of her dispute with Abyssinia. But since nobody could, without experience, be certain that their effect would suffice, the League Powers had to consider the extension of the original measures. There can be little doubt that oil would have been from the first included in the list of commodities of which the export to Italy was stopped by the League Powers, but for the doubt that their internal embargoes on it would be effective. The largest producer of oil in the world is the United States, and it would be of little use for the League Powers to refuse oil to Italy if the United States was likely to make up the deficit. If it became clear that the United States Government would not allow their citizens to be the succour of a war-making Power which the rest of the world were trying to restrain, the addition of oil to the list of exports prohibited by the Powers enforcing sanctions would become inevitable, as soon as it could be organised.

Such is the dependence to-day, of every European country except Russia and Roumania, upon imported oil fuel, not only in the conduct of war but in almost every department of national life, that there is little doubt that an oil embargo would prove an effective sanction. Evidently it is so regarded in Italy ; for while the sanctions adopted earlier were there regarded with comparative equanimity, the mere prospect that an oil embargo might be imposed was sufficient to bring forth threats from the Duce of war against any Power which took part in it. A warning that any contemplated action "will be regarded as an unfriendly act," is a well-established diplomatic euphemism for a threat of war.

It appears probable that the reasons why the League Powers did not proceed to the external measures authorised by Article XVI were two-fold. In the first place, before the attitude of the non-member Great Powers was known, to attempt to enforce either the full "prevention of intercourse" of the Covenant, or even the lesser measure of preventing the supply to Italy, by smugglers or by citizens of non-member Powers, of those commodities which the League Powers were themselves refusing to supply, would be to run serious risk of embroiling themselves with the non-member Powers, in particular the United States of America. In the second place, in consonance with the principle that League action should be such as to limit the scope of any war and not extend it, they refrained from any action which would provide Italy with a plausible cause for attacking any of their number. For "prevention of intercourse," however limited its scope, can only be carried out effectually by arrest of any ship which is attempting to carry it on; and this amounts to a sea blockade, which involves what are technically, according to international law, acts of war.

There can be, in reality, no such thing as a "pacific blockade." In a blockade enforced as part of the operations of war, the men-of-war engaged in it have no greater rights against merchant vessels, neutral or enemy, than that of arrest. In order to determine whether any merchant ship encountered by the blockading force is or is not liable to arrest, men-of-war have the right to visit and search them; and if the result of search is such as to justify arrest, the merchant ship must be sent into port to be dealt with strictly in accordance with the process of law as determined by a Prize Court. If a merchant ship resist visit and search the man-of-war may use that degree of force necessary to overcome the resistance, but no more. A so-called "pacific blockade" could do no less; a warlike blockade may do no more.

But exercise of the right of visit and search is, according to international law, an act of war, for it is a right which international law accords to a belligerent only.* Technically, it is no less so because it is exercised, not as part of warlike operations legitimised by a formal declaration of war, but in the course of operations undertaken, under the name of sanctions, with the object of limiting or stopping a war. So far as the League Powers are concerned, there is no paradox in this; for they have assented, in signing the Covenant, to the use of sanctions against any of their number who "resorts to war." When they adjudge a State to have done so, they agree that he shall "*ipso facto* be deemed to have committed an act of war against all other Members of the League," thereby legitimising their own commission of certain technical acts of war against him, even if they do not themselves proceed to the full length of war. They also resign the right to object to the exercise, by the navies of those Powers which may act on behalf of the League, of the right of visit and search of their merchant ships.

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* "The right of visit and search may be exercised by all warships and military aircraft of belligerents. Since it is a belligerent right it may, of course, only be exercised after the outbreak, and before the end, of war." Oppenheim. "International Law," 1921 Edn., Vol. II, p. 605.

Non-member States, however, are under no obligation to be complaisant. They may well object to the commission, by interference with their merchant ships, of acts of war by Powers which have not only not declared war, but have studiously refrained from doing so. Even if they admit the justification for those acts of war, recognising it is provided by the existence of the Covenant, they may well stand upon their full rights as neutrals under international law, and object to the degree of interference with their sea-borne commerce which is involved; as the United States objected, almost to the length of declaring war against Great Britain, to the operations in control of neutral commerce by the British Navy in 1914–17.

Nor is the State against which sanctions are being applied likely to concede their legitimacy Italy has never admitted the justice of the almost unanimous decision of the Assembly of the League that her acts had been such as to bring Article XVI of the Covenant into force. She would therefore be plausibly justified in treating measures of blockade taken by the League Powers as justifying attack on them; for although those acts might be solely directed against neutral shipping and not against her own—intercourse by Italian ships could be effectually prevented by boycott in foreign ports, without the necessity of stoppage at sea—they are acts of war against her. She might be restrained from attacking the League Powers concerned by considerations of expediency, by the prospect that she could not hope to be successful in a war against the rest of the world. But equally she might, believing that the League Powers would not in fact support one another, see a good prospect of breaking up the coalition against her by attacking the navies of the blockading Powers. In the latter case, the imposition of blockade would provide her with a plausible justification for doing so, and would involve serious risk of extension of the war which the League is doing its best to bring to an end.

It is by no means certain that the League Powers will continue indefinitely to refrain from employing the external measures prescribed by Article XVI. It may well happen that the sanctions first adopted will prove ineffectual as a means of inducing Italy to abandon the course of action she is now pursuing, and to submit to a judicial settlement approved by the League. Even with the oil embargo added to the list, it may be that there will be sufficient leakage to enable Italy to carry on the war. If so, the League would be compelled either to acknowledge defeat and confess itself powerless to fulfil the function for which it was created, or to proceed to the imposition of sanctions more effectual than those already in force. The next measure could be none other than blockade, either partial, designed merely to check evasion of existing embargoes, or complete.

The first of the two reasons which originally prevented the imposition of a blockade—fear of embroilment with the United States—seemed for a time to have less force than had been anticipated. The United States under their neutrality legislation were enforcing an embargo on the supply of war material to both belligerents. Moreover, Mr. Roosevelt, when issuing the declaration of neutrality on October 6, 1935, attached to it a statement which concluded in the following words: "I desire it to be understood that any of our people who voluntarily engage in *transactions of any character with either of the belligerents* [italics are mine] do so at their own risk." This seemed to be a clear intimation that the United States Executive did not intend to support, against any foreign Power that might interfere with it, the claim of American citizens to continue unchecked their trade with either belligerent, whether in contraband of war or anything else.

Later, however, Congress manifested a tendency, under the stimulus of a manifesto by Mr. John Bassett Moore, a recognised authority on international law, to return once more to rigid insistence upon the principle of "Freedom of the Seas," and to limit the freedom of the Executive to depart from it. It is impossible, at the moment of writing, to prophesy the precise form in which American neutrality legislation, now about to expire, will be renewed. But there is at least a possibility that a blockade instituted by the League Powers might be able to avoid offence to the United States; though the probability is small.

The second reason against blockade—the danger of provoking Italy into forcible retaliation—remains just as cogent as it had ever been. The weight to be given to it, however, depends chiefly upon the degree of solidarity to be expected amongst the League Powers. The danger is by no means negligible, as was shown by the earlier state of tension between Italy and Great Britain, and it is likely to be intensified by the adoption of measures increasingly irksome. But if the League Powers were really in earnest in their professed attachment to the Covenant, and determination to act in accordance with it, it must be obvious that Italy could not really support the burden of a war against the rest of Europe, when already deeply committed in East Africa, for more than a very short period. None of the League Powers would be likely to provoke an Italian attack if its colleagues were disunited and hesitant. To do so would be to expose itself to the almost certain prospect of war, with little or no prospect of success in attaining the object of its action—the submission of Italy to a judicial settlement. But a united and determined League might well decide to run the risk of Italy's declaring war on the world. The risk would be so much the less by reason of the unity and determination of the League; and damage that Italy could do in such a war might well be adjudged less than the damage that would follow from condonation by the rest of the world of flagrant aggression and breach of faith.

Then some possibility still exists that the British Navy may find itself under orders—presumably in co-operation with the navies of other League Powers—to prevent either the import into Italy of specified commodities, or even any intercourse with Italy by any ship under another flag. Since Italy's shores can only be approached by entering the Mediterranean Sea the most obvious and least ostentatious method of controlling access to them would be to exercise control in the Straits of Gibraltar and the Gulf of Suez. It seems probable that control would first be instituted in those areas; this would involve the visit and search of all vessels passing inwards, and the arrest of those which could not satisfy the blockading authorities that they or their cargoes were not destined for Italy.

But that action would not suffice. Besides the coasts of Italy herself, there are the Eritrean and Somali coasts, which, being in direct communication with the seat of war, could not be left out of any blockade intended to be effective. Their blockade would involve much more elaborate operations and more numerous forces, and though it presents no intrinsic difficulties, the blockading forces would almost certainly encounter ships of the Italian Navy in the course of their operations. Moreover, it might be that the intercourse which it was the duty of the blockaders to stop was taking place within the Mediterranean, by evading the embargoes supposed to be in force in all the League countries. If so, the distant blockade at Gibraltar and Suez would be ineffective, and would have to be supplemented inside the Mediterranean. This need not involve a close blockade of the whole of the Italian coast since the source of the leakage would certainly be known. But blockade within the Mediterranean, even if conducted at the sources of leakage and far from Italy, would again increase the probability of encounter between the blockaders and the Italian Navy.

Though none of these blockade measures presents in itself any very difficult naval problem, a difficult political problem is presented by the disposal of any ships that might be arrested. In war, they would be remitted to a Prize Court; but it is doubtful whether, in this country at least, a Prize Court can be legally established unless there has been a declaration of war. Nor is it beyond doubt whether, if a British Prize Court could legally be set up, the others Powers concerned would be satisfied with its competence. This difficulty would have to be faced and resolved before the League Powers could enforce a blockade.

There is, however, a serious naval problem which arises in such circumstances. The navies conducting a blockade must be prepared for the eventuality of its being taken by Italy as a *casus belli*. They must in fact be prepared, from the moment of the adoption of a blockade being seriously proposed, for attack by Italy. Statesmen and governments would perhaps be themselves satisfied that the danger of Italy attacking their forces was so small as to be negligible, before they would take the responsibility of ordering the imposition of any measures of blockade. But no admiral entrusted with the task of carrying out those measures could afford to neglect that danger. However remote it may be, he would have to take it into account and provide against it.

H. G. THURSFIELD.

CHAPTER VI.

THE NAVAL RESERVES.

AT a time like the present, when the personnel of the Royal Navy is reduced from its 1914 strength of 152,000 to only about 95,000 officers and men, it is important to draw attention to the established personnel Reserves for the Navy, and to recall what reserve organisations there are, what conditions must be fulfilled to join them, what methods and periods of training are employed, and, in general, what uses the Reserves are put to.

The principal source from which the Navy supplements its professional officers and men in war time is the Royal Naval Reserve. It is not a very old force, and dates only from 1859, when an Act of Parliament authorised the establishment of some 20,000 men under the name of the Royal Naval Volunteers. This political ukase resulted from a very serious deficiency in the Fleet, which had then existed for two or three years. For instance, H.M.S. Diadem, commissioned in 1857, had to wait five months to complete her crew; the Renown, in the same year, was detained six months; and in 1858 the Marlborough was delayed for over four months, an inefficient and irritating state of affairs.

Every few years since then there have been Orders in Council, parliamentary authorisations, and regulations which result in the force as we see it to-day, administered by a flag-officer known as the Admiral Commanding Reserves, assisted by his staff and an Advisory Committee over which he presides. On this Committee the Registrar-General of Shipping, the Shipowners' Association, and the senior R.N.R. officers have representation, and provide a connecting link between the various interests of the force and its administration.

In general the personnel of the Royal Naval Reserve is now organised into three separate classes according to the nature or service for which their civil employment and personal abilities suit them. There is *Fleet Service* in which the officers and men serve in all classes of H.M. ships, in mercantile cruisers, and in auxiliaries. There is the very interesting *Patrol Service*, in small craft, mostly hired and armed, which do Auxiliary Patrol duties, anti-submarine, mine sweeping and escort work, etc.* Although there is not really such a thing as shore service in the R.N.R., certain appointments elsewhere than at sea with a multitudinous list of special duties have to be filled in war time, towards which, as war proceeds, those unfitted by wounds and ill health, or incapacitated by age, naturally gravitate.

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* A lecture given by the present writer on the organisation and work of the Auxiliary Patrol in the late War has been reprinted in the February, 1933, number of the Journal of the Royal United Service Institution.—EDITOR.

For executive officers originally no higher rank on the Active List than Lieutenant existed, but now the executive officers follow the naval ranks exactly, from Midshipman to Commodore, and wind up with three grades of Skipper, R.N.R., intended for command of such craft as trawlers and drifters, in which types they have spent most of their lives. Engineers have five ranks, from Warrant Engineer to Engineer Commander, and accountant officers four, beginning with Paymaster Sub-Lieutenant. In addition there are honorary commissions granted to those who have specially advanced the interests of the Reserve, and as a war-time expedient only temporary commissions are granted to those selected from volunteers desiring to serve.

To begin a career in the rank of Probationary Midshipman the candidate must first of all be a British subject and medically fit; these conditions apply to all entries and need not be again referred to. He either appears from an approved mercantile training ship, or, after a year's service, from a first class British merchant ship, and he must be between the ages of sixteen and nineteen. It is a *sine qua non* that the Committee of his training establishment, or the Master of his ship, should have given him good testimonials, and recommended him as a suitable person for the R.N.R. On his part he also has to make a declaration that he intends to follow the sea as a profession. This declaration is common to the entry of all ranks and ratings, as it is a waste of time to enter and train any individual at expense to the State, if two or three years later he intends to occupy himself where wind, waves and tides cause less inconvenience than they do afloat.

Six months' naval training in a large ship gives the young officer an opportunity of acquiring the spirit, traditions, and customs of the Navy, and if he is well reported on and makes a satisfactory showing in discipline, gunnery, torpedo, seamanship, signals, handling of boats, anti-gas training, and such like, he is confirmed as a Midshipman. As his time in the Navy as a Midshipman will be short he is saved the expense of the traditional dirk, and is allowed at once to wear a sword, an advantage over the R.N. Midshipmen, which appeals to him more than it does to them.

But even if foreign service, or other good reason, has prevented him trying to become a Reserve officer until he is past nineteen, other gangways are available. He can enter as a Probationary Acting Sub-Lieutenant between twenty and twenty-two if he has a Second Mate's certificate and satisfactory records, and become an Acting Sub-Lieutenant after three months' naval training; or he can submit himself between twenty-one and twenty-seven if he has a First Mate's certificate under twenty-six, and a Master's Certificate if over twenty-six, and in each of these last two cases he must have served at sea within six months of making his application. A Board of Trade Master's Certificate may enable a specially suitable candidate to be entered direct as a Probationary Lieutenant. The Midshipman after his naval training does not get his next step until he is twenty-one and holds a Second Mate's Certificate, and before the Acting Sub-Lieutenant can get confirmed in his rank, he must, after his naval training, hold certificates that he has kept bridge watch to the satisfaction of his Master in 8,000 ton ships making an average speed of 13 knots, with a crew of not less than 130 men. This method puts the first responsibility of selection of officers for the R.N.R. on to the Merchant Navy itself, for no matter what the age of the applicant, or what ambitions move his heart, he can get nowhere in the Reserve unless the Merchant Navy Masters he has served under certify as to his ability, his conduct and his suitability. Assuming that the entries by these different methods are now Sub-Lieutenants they must do nine months' naval training, be of two years' seniority, have held First Mate's certificate for twelve months in full charge of a watch at sea for eight hours out of the twenty-four, and again—most important—be satisfactorily reported on by their superiors before they can be promoted to Lieutenant, R.N.R. But if circumstances have prevented one of them doing his twelve months' naval training, he is still eligible for promotion at three years' seniority, if he has done two years' sea service, and has performed twenty-eight days' naval training biennially.

Once the rank of Lieutenant is reached, officers are given seniority up to twelve months according to the classes of certificates obtained and the reports upon them, but they cannot console themselves that all their troubles are over, for unless a Master's certificate is obtained before thirty, or satisfactory reasons produced for its absence, a risk is run of compulsory resignation of R.N.R. rank. When regulations of this sort rear their head, the cause is nearly always found on investigation to be one of the impracticability of the individual combining his service to his owners in odd parts of the world with the necessity of carrying out his naval training, which, perforce, is the very essence of his qualification as a Naval Reserve officer. Difficult cases of this sort do not frequently arise, and when they do are treated with sympathy, and every effort is made to find a way out. But it is not always possible to solve the problem, and I remember the late Sir Ernest Shackleton had to resign from the Reserve because of some such insuperable difficulty.

After eight years the Lieutenant, R.N.R., like the Lieutenant, R.N., is advanced to the comparatively modern rank of Lieutenant-Commander, providing he is satisfactorily reported on, and has completed nine months' naval training, though here again special arrangements are made to meet the case of his being short of the qualifying period of his naval training.

In the Great War Lieutenants and Lieutenant-Commanders, R.N.R., were commanding groups of patrol vessels, torpedo boats, torpedo boat destroyers, mystery ships, and all sorts of warlike craft.

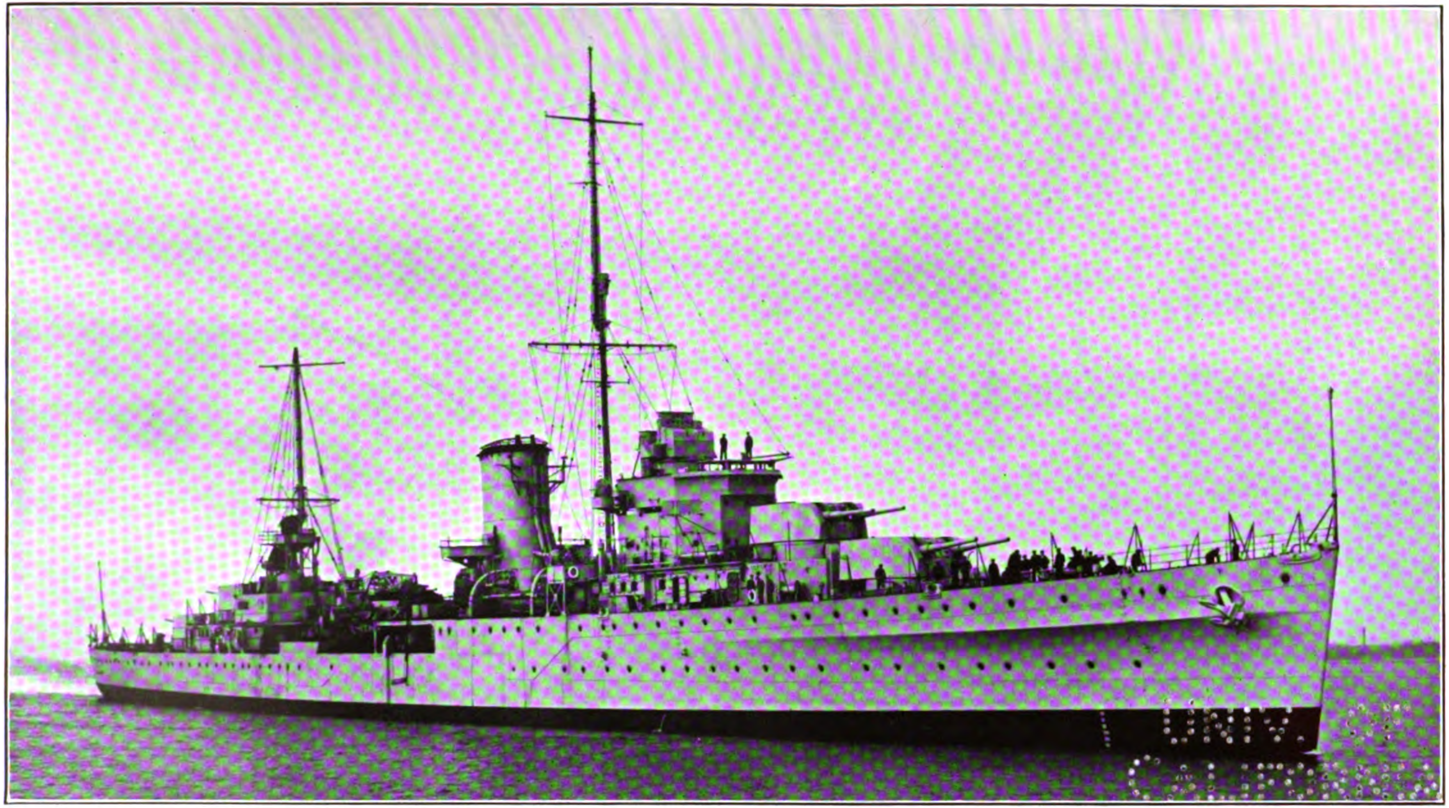
The next promotion, to that of Commander, is a sterner matter. The officer must have been three years in his rank, have done twenty-eight days' naval training triennially, and have either been in command of a British foreign-going vessel for two years, or been Chief or 1st officer for four years, and in this last case his owners must testify that he is in all respects suitable for command of a ship, had there been one available for him. His records must be good, and he then has to be selected for promotion from a larger number of "availables" than there are vacancies.

The last ordinary promotion is to the rank of Captain, R.N.R., which is again governed by selection from among those qualified. To be considered at all, the Commander, R.N.R., must have served five years as such, and have been at sea in command of a large British foreign-going liner for three years. Also he must have performed specially good service in his profession, or for the R.N.R. By this time the officer will probably have become eligible for the R.N.R. Decoration, which requires at least fifteen years' service in commissioned rank, and the completion of twelve months' continuous naval training. And after the great service rendered to the nation by the Merchant Navy in the 1914–18 War the King commanded that there should be two Royal Naval Reserve Aides-de-Camp specially selected and appointed to serve His Majesty in that very honourable capacity. If it is true that it is the boast of the poor apprentice that the only nasty job the Master cannot make him do at sea is to dig a grave, it may be a consolation to the boy in the midst of his other tasks to know that there is a possibility in his remote future that Buckingham Palace may appear towards the end of his journey. And providing certain conditions as to crew, etc., are complied with the R.N.R. officer in his capacity as Master of a merchant vessel can be issued with an Admiralty Warrant authorising him to fly the Blue Ensign from his ship instead of the Red. At present this great privilege is exercised by about 106 Naval Reserve officers.

The last step of all is the honorary rank of Commodore, R.N.R., which may be granted, and which is retained on retirement, in recognition of specially good service as a Captain, R.N.R., on the Active List. At present there are six such Commodores out of forty-two retired Captains, and as these owe the compliment to exceptionally good service in the War of 1914–18, and such opportunities do not occur in peace time, it is obvious that the tendency must be for the number of Commodores to decrease, or for the process of selection to be beset with many difficulties, if the title is to retain a value which would always make it highly prized.

One of these retired Captains, R.N.R., with distinguished War service in India is also an honorary Brigadier-General—a rank which in his younger days at sea I doubt if he ever anticipated he would achieve.

I have not dealt with the pay and allowances of the R.N.R. officers, which range from 5*s*. a day for a Midshipman, 10*s*. for a Sub-Lieutenant, 13*s*. 4*d*. to 34*s*. for Lieutenants and Lieutenant-Commanders, 40*s*. to 52*s*. for Commanders, and 60*s*. to 75*s*. a day for a Captain. There are uniform allowances, the usual naval travelling expenses and actually a rebate of income tax in respect of maintenance of uniform. There is a percentage disability retired pay in case of injury or sickness, and pensions to widows and allowances to children, in event of death following injury on service or war wounds.



H.M. CRUISER AJAX, 7,000 TONS.

Commissioned for Service, April 15, 1935.

(*By courtesy of the builders, Vickers-Armstrongs, Ltd., Barrow-in-Furness.*)

The training received by the Reserve officer, when serving in the Navy, is such as to adapt him for duties of an entirely different character from those which occupy his normal life. He is given opportunities of imbibing a good working knowledge of practical gunnery, hydraulics, fire control, ammunition, anti-gas, field training; and of torpedo work, Whiteheads, paravanes, electricity, searchlights, mines, depth charges, torpedo control, etc. Then there is station keeping in a fleet, tactics, strategy and signals, and sometimes courses in mine sweeping and submarines. And senior R.N.R officers, if they can find the time, can attend the war courses held half yearly at the Royal Naval War College at Greenwich on questions of higher naval command, and also technical and tactical courses at Portsmouth.

WARRANT OFFICERS.

The Skipper, R.N.R., is a warrant officer, who, after ten years' seniority, may be made a Chief Skipper, and who subsequently may be selected for the rank of Skipper Lieutenant. These excellent men can come up for selection to be warranted between the ages of twenty-three and twenty-five, if they have commanded a British steam or motor fishing vessel for one year, and have the necessary Board of Trade Certificate as a Skipper, but at present there is an excess of numbers, and so they are only entered through the ranks of the R.N.R. These warrant officers do fourteen days' naval training in sweeping, station keeping, signals, etc., in each of their first three years after being warranted, and fourteen days biennially afterwards. Their duties are for the Patrol Service only, and their employment is in trawlers, drifters and similar craft engaged in patrol duties, mine sweeping, coastal escort and similar work. Their pay ranges from 12*s*. to 29*s*. a day, and if they have done twenty years' qualifying service they can receive a retiring gratuity of £60, and, of course, disability awards and widows' pensions.

ENGINEERS.

The candidate for Probationary Engineer Lieutenant has to be under thirty years of age, and hold a Board of Trade Certificate as 1st Class Engineer of a steam or motor ship with steam endorsement, and produce satisfactory records. Engineers employed in marine factories or marine workshops are also eligible under similar conditions. The Probationer after completing three months' naval training and being found suitable is confirmed in rank. And eight years later, having done four months' naval training, satisfactory records will make him an Engineer Lieutenant Commander. Thereafter promotion to Engineer Commander is by selection from those who have three years' seniority in their previous rank, have done twenty-eight days' naval training triennially, and have consistently good reports of service. But at present the entry of Engineer Lieutenants is suspended. Pay is practically the same, rank for rank, as for executive officers.

There is also a Warrant Officer Engineer Branch to which chief and engine-room artificers may be promoted, if specially recommended after their naval training. They begin as Warrant Engineers and can become Commissioned Warrant Engineers after attaining ten years' seniority with satisfactory records, and from these two last named ranks special selections are made for the rank of Engineer Lieutenant.

ACCOUNTANT BRANCH.

To be between twenty-one and twenty-five years of age, to be medically suitable, and to have had at least three years' experience in banking or cash accountancy with very good testimonials; or to have had two years' service as Purser or Assistant Purser in a merchant vessel, are the requirements from the candidate for the rank of Probationary Paymaster Sub-Lieutenant. And after twenty-eight days' naval training, and passing an examination on board the ship in which he has been trained, the Probationer can be confirmed, and promoted to Paymaster Lieutenant two years after entry, provided he has done fourteen days' training biennially and is recommended. Very similar conditions must be satisfied when eight years later availability for advancement to Paymaster Lieutenant Commander is reached. Promotion to the rank of Paymaster Commander, subject to fourteen days' naval training triennially, consistently good records and four years' seniority is by selection. Certain selected Registrars, Assistant and Deputy Registrars can also obtain commissions in the Accountant Branch, but these officers do not do naval training afloat, are not formally called out, and do their duties on shore.

Naval Reserves are also maintained in Australia, Canada and New Zealand with regulations based on those already summarised and specially adapted to the local conditions and requirements.

R.N.R. MEN.

The men of the R.N.R. consist of chief petty officers, petty officers, leading seamen and seamen; chief stokers, stoker petty officers, leading stokers and stokers; seven classes of engine room artificers, and second hands and enginemen for service in trawlers and drifters. It is unnecessary to enter here into all the conditions for enrolment. The Reserves are called out to service by Royal Proclamation, and on joining their ships for active service are each credited with a £5 bounty and a war clothing gratuity. To be eligible for enrolment in the Reserve the seaman must be between eighteen and twenty-five years of age, be efficient in compass, steering, lead and line, pull a good oar, and have served at sea for two years, within six months of application. Time served in training ships and establishments counts as half time towards qualification. Common to all entries is the requirement of satisfactory conduct reports, and a declaration that the applicant intends to follow the sea as a profession for a further five years. In the first year of enrolment the seamen do twenty-eight days' training in naval barracks, and fourteen days' in a battleship, and in subsequent training periods the time in barracks is reduced to seven days, and the battleship time varies between fourteen and twenty-one days, where seamanship, gunnery, torpedo, signalling, etc., are all taught.

Engine room artificers must be between twenty-one and thirty, and serving afloat or on shore as efficient workmen at their trade of engineers, fitters, coppersmiths, boilermakers or engine smiths. When not actually enrolled they must be serving where their professional efficiency will be maintained. The training periods in the Fleet are three months continuously in first year of enrolment, and subsequently three months in three of the four succeeding periods of five years' enrolment. A good system of promotion exists, and the pay varies between 6*s.* 11*d.* and 11*s.* 6*d.* a day. To attain the rank of Warrant Engineer the artificer must be between twenty-eight and forty, have special recommendations after training periods, and own a 1st class engineer's certificate. The highest rank, that of Probationary Engineer Lieutenant, requires high qualifications and selection at the discretion of the Admiralty.

Annual retaining fees varying from £12 to £4 are paid to Reservists, and such items as clothing grants, embarkation gratuities, prize money, marriage allowance, compensation for injuries and widows' pensions if killed on service, are paid under suitable circumstances.

In addition to the R.N.R. there is a Royal Naval Wireless Auxiliary Reserve and a Royal Naval Sick Berth Reserve, both separately administered. The Wireless Reserve is organised into nine districts in this country, and has District Commanders, Section Lieutenants, Honorary Officers in both ranks, and the necessary personnel.

The strength of the Royal Naval Reserve at the present time is about 9,000 officers and men, but in the Great War the numbers mounted as high as 67,000.

If not serving in men-of-war, the Reserveman, in time of war, if not detailed to serve in his own ship, may serve as required in other vessels of the Merchant Navy. It is not practicable to enumerate all the uses to which merchant ships have to be put in war, but the following brief and skeletonised description gives a general indication of the duties a Reserve Officer or man may find himself doing in addition to his own life's work of mail, trade and passenger carrying.

Very large liners like Aquitania, etc. ...	Are employed as troop carriers or hospital ships, but generally may not be very suitable as Armed Merchant Cruisers.
Handy size liners ...	Are armed to supplement the fleet cruiser squadrons in guarding and patrolling areas, assisting in blockade and search, escorting ocean convoys, and sometimes are used as fast minelayers.
Fast ships of cross Channel type ...	Are armed as aeroplane carriers, minelayers or minesweepers, patrol services, escorts to convoys on coasts and in narrow seas, despatch vessels, etc. Sometimes as hospital ships.

Ordinary merchant ships	Used as block ships, wireless links, Q-ships, store, coal and oil carriers, dummy warships, depots for guns, ammunition, torpedoes or mines and a host of other things.
Yachts, trawlers and drifters and small craft generally ...	Are employed as auxiliary patrol vessels coastally at home and abroad, and if of a suitable size and seaworthiness, for ocean work—minesweeping, minelaying, mine destroying, escorting, rescuing crews of ships wrecked, torpedoed or sinking, landing and embarking agents, etc.
Small coastal craft ...	Are used for similar work to the last named group in waters suitable to their capacities.
Trinity House vessels ...	Attend and maintain navigational marks of all kinds, and any necessary special pilotage or hydrographical work.

Common to all the above ships is the duty of troop carrying, evacuation of wounded, and the liability to conversion to hospital ships or hospital carriers.

THE R.N.V.R.

The Royal Naval Volunteer Reserve in its present form is a much younger force than the Royal Naval Reserve. And its constitution differs, since its members do not require to have the official Board of Trade Certificate of competency as seamen, nor need they follow the sea professionally. It consists of some 5,000 amateur seamen and others, many of whom in their spare time are yachtsmen of skill and ability, and a balance whose enthusiasm for the sea and ships eventually brings them, after training, to a standard of knowledge sufficiently high to make them of value to the State when called out for naval service.

A force of Royal Naval Coast Volunteers had been raised in 1853, but it died out twenty years later and an Act of Parliament of August 5, 1873, produced a new force known as the Royal Naval Artillery Volunteers intended to provide trained gunners for service within the home seas. This force had a drill ship (first the Rainbow and then the Frolic) moored in the Thames off Somerset House. At one time it numbered sixty-six officers and 1,849, men, but owing to regrettable misunderstandings, frictions and jealousies, it was disbanded on April 1, 1892.

It was not until eleven years later that the Naval Forces Act called into being the present Royal Naval Volunteer Reserve which, now being in its thirty-fourth year of existence, and having withstood the temptations of peace and the strains of war, may be said to be a successful and permanent addition to the Naval Forces of the Crown.

Like its professional brother, the R.N.R., the R.N.V.R. is under the Admiral Commanding the Reserves. The force is divided into eight divisions—London, Severn (Bristol), Clyde (Glasgow), East Scottish (Leith), Sussex (Brighton), Tyne, Mersey and Ulster (Belfast). Some of the Divisions have outlying subdivisional bases. For instance, Greenock is attached to Glasgow, Newhaven to Brighton, and Dundee to East Scottish Headquarters. Each

Division has a Naval Instructional Staff, and there are shipkeepers or caretakers for drill ships or drill halls. The Admiral inspects each Division annually, but he and his staff are in touch with every section all the year round.

There are growing R.N.V.R. divisions in Canada, South Africa, Australia, Hong Kong, Singapore, Ceylon, Kenya and Newfoundland. And Captain Sir Edward Headlam, a former Director of the Royal Indian Marine, has publicly stated that tentative steps are being taken to form such a force in India.

There are ten ranks of executive officer from Commodore to Warrant Officer; four ranks of engineer officers from Engineer Commander to Engineer Lieutenant; five ranks of medical officers; two of dental; and four ranks of accountant officers, ranging from Paymaster Commander to Paymaster Sub-Lieutenant, probationary rank preceding confirmed rank in several cases. All take precedence rank for rank after R.N. and R.N.R. officers and are furthermore divided into List I and List II.

The uniform of both officers and men is identical with that of the Navy except for the narrow wavy gold lace on the officers' sleeves. The men additionally wear the letters R.N.V.R. on lapel or sleeve, and cap ribbons bear the name of the Division, and the letters R.N.V.R., but at sea they wear the ship's cap ribbon. All ranks and ratings when serving receive practically naval rates of pay.

Partly by drills on board ships or in drill halls at their local headquarters, partly in their spare time, and partly by short periods of training in the naval schools and on board the ships of the Fleet, the R.N.V.R. reaches a sufficiently high standard of knowledge to enable it to become immediately available for the R.N. in event of war, and the administration arrangements are such that units can be drafted straight to ships on mobilisation.

AMENITIES AND TRAINING.

At headquarters the drills and instruction and service are made very attractive. Swimming, boat sailing and pulling, boxing, rifle clubs, week-end camps, etc., are mingled with sterner duties. The most sought after feature of the training is service afloat in H.M. ships. It gives a complete change from life on shore and provides a healthy and interesting occupation of a type unobtainable by any one outside the Naval Reserves. Many a man devotes his holiday to his training and never regrets having done so.

Reduced to simple form, each man enrols for four years' service at a time and is given a free kit; he can renew his four year engagement for a total of twenty years; and in each of these years he must make himself efficient. He can do this very simply by attending forty drills of one hour each in the first, and twenty-four drills in each of the last three years, and gets a £3 bounty each year for doing so. In addition he must do forty-two days' training in a naval ship or establishment during his first four years; he is permitted to do three months if he wishes and by working his time suitably he can make it coincide with a Fleet's foreign cruise, and thus widen his knowledge of the world. What an advantage over the territorial soldier, whose camp, as to date and place, is a very arbitrary matter!

Buglers can enter at fifteen, and boys at seventeen; ordinary seamen, signalmen and telegraphists must be between eighteen and twenty-six years of age. The artisan ratings, such as shipwrights, joiners, plumbers, painters, coopers and blacksmiths, enter between twenty-one and twenty-eight, and must be fully qualified tradesmen. Artificer ratings are eligible between twenty-one and twenty-eight if qualified tradesmen, and if they are boilermakers, fitters, smiths or coppersmiths become engine room artificers. Gunsmiths become ordnance artificers, and electricians electrical artificers. A limited number of men with knowledge of clerical work, shorthand and typewriting are entered as writers. All must pass the medical examination and be the sons of British subjects. There are good prospects of advancement for those who show an interest in their work. The ordinary seaman can become an A.B. in one year, four years later a leading seaman, and a petty officer after eight years. Applicable opportunities are available in all branches.

The Volunteer has few obligations beyond doing his drills and training. He must keep his kit in good order, attend the Admiral's inspection and report at his headquarters when called. When he sees a Royal Proclamation calling out the R.N.R., he expects and awaits the individual summons which is the method employed to bring the R.N.V.R. to war service.

OFFICER BRANCHES.

Officers are entered in either the Executive, Accountant, Engineer, Chaplain, Medical or Dental branches and are divided into two lists. List II comprises those who prepare themselves for war by training afloat, but who are unable to attend the ordinary routine drills, etc., at their headquarters. The officers do not enrol for specific periods. British nationality and medical examinations are insisted on. They get a uniform grant of £50, and must serve one year and do their first period of training before being confirmed. The ages of entry differ for the various branches: thus Probationary Midshipmen enter between seventeen and twenty-one, Sub-Lieutenants twenty-one and twenty-four, Engineers twenty-three and twenty-eight. Chaplains under forty, Paymaster Sub-Lieutenants twenty-one and twenty-five, Medical Officers twenty-one and thirty-two, and Dental Officers between twenty-one and thirty years of age. There is also a special branch which is practically only needed in war time when the Navy can use specialists such as civil engineers, chemists, designers, professors, artists, interpreters, etc.

Executive officers have to make themselves efficient every year by attending their headquarters or ships and doing certain periods of training on board the ships of the Fleet, and they get promoted after qualifying examinations and terms of service which vary with their rank. A Midshipman can become an Acting Sub-Lieutenant at twenty, a Lieutenant at about twenty-three, and a Lieutenant Commander at say thirty-one; from thence to the ranks of Commander and Captain promotion is not only by selection but as vacancies exist. Two officers have been made Commodores.

Accountant officers make attendances at their headquarters for duties such as correspondence, custody of money, stores, accounts, etc. But as they have to have good business qualifications and experience before joining at all, these matters of training are quickly assimilated and enable them thoroughly to enjoy the twenty-eight or fourteen days' service with the Fleet which they are privileged to undertake. Two years' satisfactory service sees them Paymaster Lieutenant, and eight years later they become Paymaster Lieutenant Commanders—their final advancements being by selection. There is also a List II in this branch, the officers in which are employed in war time in confidential cyphering, coding, and other clerical work. The doctors go afloat in the Fleet, attend very regularly at headquarters to examine recruits and drafts, attend rifle and revolver practice, and their promotion system is akin to that of the naval surgeons. Members of the dental branch do not drill—at any rate not in the naval meaning of the word—and follow a similar routine to the medical officers. The Chaplain branch of the R.N.V.R. must be the envy of the schoolboy, for of all the officers in this Reserve, the Chaplain is in the position of not having to do any compulsory training at all! He is expected to devote a considerable amount of time to work at his Divisional Headquarters, and always regrets that he does not have to do any training at sea.

In the war of 1914–18 the R.N.V.R. was represented in every theatre afloat and on shore, and its members are proud of the fact that they were the first volunteer unit to go into action. Their Armistice strength stood at 38,000, and Reserves in Dominions and Colonies totalled 2,000. To encourage the young idea there are Boys Corps attached to both the Sussex and Clyde Divisions, R.N.V.R., totalling about 100 boys. Six Volunteer Cadet Corps numbering about 600 boys are attached to the Naval Schools and Depots at Portsmouth, Chatham and Plymouth, and four similar Cadet Corps with some 500 boys are affiliated to the Royal Marines at Chatham, Eastney, Plymouth and Deal. The Sea Cadet Corps, to which the Navy League contributes about 1,400, Marine Society 141, Church Lads Brigade 221, British Sailors Society 100, Watts Naval School 235, and Scarborough Education Committee 50 boys, also thrives. All these training centres foster a love of the sea in young people, many of whom join the R.N. or one of its reserve forces with bell-bottomed trousers and glad hearts.

I hope our Naval Reserves, both grown up and juvenile, may never be allowed to fall into a state of decay, and that should they do so, it may please Him " who bridles the sea with a rope of sand " to put bounds to the fury of the people!

H. S. Lecky,
Captain, C.B., A.M., R.N.

CHAPTER VII.

VICTUALLING THE NAVY—AS IT WAS AND AS IT IS.

WHEN I joined the Victualling Department of the Admiralty in 1891 I soon found myself asking questions about many things to which the various replies may be summed up as nothing more than "It's a way we have in the Navy." Pertinently I asked why, if we were supposed to be feeding the Navy, did we put stores on board for consumption and then allow the men the option of taking up "Savings" in lieu and leave them to buy most of their requirements from the ship's canteen or bumboatmen?

At the commencement of my service I was sent to the Royal Clarence Yard at Gosport, and I soon became familiar with old sailors' yarns about ships' provisions which were so old that you could, for example, make no impression on the salt beef with your teeth, but when dried out it would take a high polish; and about having to knock the weevils out of the biscuit before you could eat it, and even then mastication was only possible after soaking it in your tea. Did these suggest an answer to my question? If so, I could only wonder how long this method of victualling the Navy, known as the Savings system, would last. The principle of Savings, having been in force since 1799, seemed to be accepted as quite unalterable, and for the moment one might say that the general feeling was in its favour.

THE SAVINGS SYSTEM OF VICTUALLING.

The official scale of victualling as then laid down, which I set out in full so that it may form the basis of my comparison of the Victualling of the Navy—as it was and as it is—and also enable the defects of the system to be better understood, was this:—

Each officer and man was entitled to the following:—

Daily: Soft bread, 1½ lb., or biscuit, 1¼ lb., or biscuit, 1 lb., and flour, ¼ lb.; sugar, 2 oz.; chocolate ordinary, 1 oz., or chocolate soluble, 1·2 oz.; tea, ¼ oz.; spirit ⅛ pt.; and when procurable, fresh meat, 1 lb.; vegetables, ½ lb.

Weekly: Oatmeal, 3 oz.; mustard, ½ oz.; pepper, ¼ oz.; vinegar, ¼ pt.

Every four days: Salt, 1 oz.

When fresh provisions were not procurable:—

Every other day: Salt pork, 1 lb.; split peas, ⅓ lb.; celery seed, ½ oz. to every 8 lb. of split peas put into the coppers.

On one alternate day: Salt beef, 1 lb.; flour, 9 oz.; suet, ¾ oz.; raisins, 1½ oz.

On the other alternate day: Preserved meat, ¾ lb.; with either (1) preserved potato, 4 oz., or (2) rice, 4 oz., or (3) preserved potato, 2 oz., and rice, 2 oz., or (4) flour, 9 oz.; suet, ¾ oz., and raisins, 1½ oz.

We can make this look less complicated by trying to visualise what it meant in actual meals if a man had to subsist solely on the official ration. Then we have :—*Breakfast,* on turning out about 5 a.m., cocoa and bread or biscuit; *Dinner,* at noon, fresh meat and vegetables or salt meat and accompaniments; *Supper,* about 4.15 p.m., tea and bread or biscuit.

You will see that on salt beef or preserved meat days, i.e. when at sea, you could make a "plum duff," and on salt pork days a pease pudding. Exactly how to fit in the oatmeal I cannot say; perhaps it was intended for porridge, but so far as I remember it was never taken up as a part of the ration.

In addition to the official meal hours set out above there was a "stand easy" at about 8 a.m. when men really had their breakfast, and they had another meal about 7.30 p.m. when the day's work was over, but these were unofficial.

The dietary looks unattractive and ill-balanced, and it seems that it was intended that messes should take advantage of the option allowed to them under this system of taking up only such portion of the full ration (subject to some restriction) as they wished, and being credited with the value at rates fixed by the Government. Presumably they were considered to be saving on their rations by leaving them, and hence the term "Savings." It was entirely a misnomer, as the payment they received in lieu did not express the full value of the articles not taken up, and the goods bought in the canteen or elsewhere in substitution thereof had to be purchased in the main at higher prices; consequently messes had to supplement their Savings by money from their own pockets.

Now here comes the irrational part of the system as I saw it. Having sketched out his idea of the day's meals the mess caterer would decide how much of the official ration he would need. Let us say he arranged for a meat pudding when fresh meat was to be issued. He could not get any flour from the ship's stores, because that was only issued with salt beef, or preserved meat, or in lieu of part of the biscuit ration. Similarly you will notice that suet and raisins could only be drawn as part of the salt beef or preserved meat ration. For general purposes, then, none of the Government provisions were available for issue except as part of the fixed ration.

This system did not lead to economical running of the messes. The mess caterers struggled with the complicated working of the system (note that decimal point "or chocolate soluble, 1·2 oz." which relates to a system of weights not yet adopted in this country), but I am sure that, except with great difficulty, they never knew at any period of the month how they stood financially, and only learned their position when the amount of Savings due to the various messes was put up after the end of each month; and then they were inclined, at times, to question the correctness of the calculations. Presumably they looked for the cheapest market, and when in port there would be considerable competition for their custom. I will deal with the question of canteens separately, but the point I wish to bring out is that the above conditions, while enabling mess caterers to provide the variety that the official ration lacked, rather opened the way to a difference in quality commensurate with the price paid.

I claim emphatically and without the slightest hesitation that the quality of the stores issued from the Victualling Yards has been consistently good, and the tendency has always been not merely to maintain the standard but to raise it. What displeased me was the fact that the canteens could stock what they liked, and this duplication meant that some of the Government provisions had such a slow turnover that they not infrequently became deteriorated from age or long storage under varying climatic conditions, with consequent condemnation and loss. It was this wastage of good food of known quality which made me feel that there was something inherently wrong with the whole system.

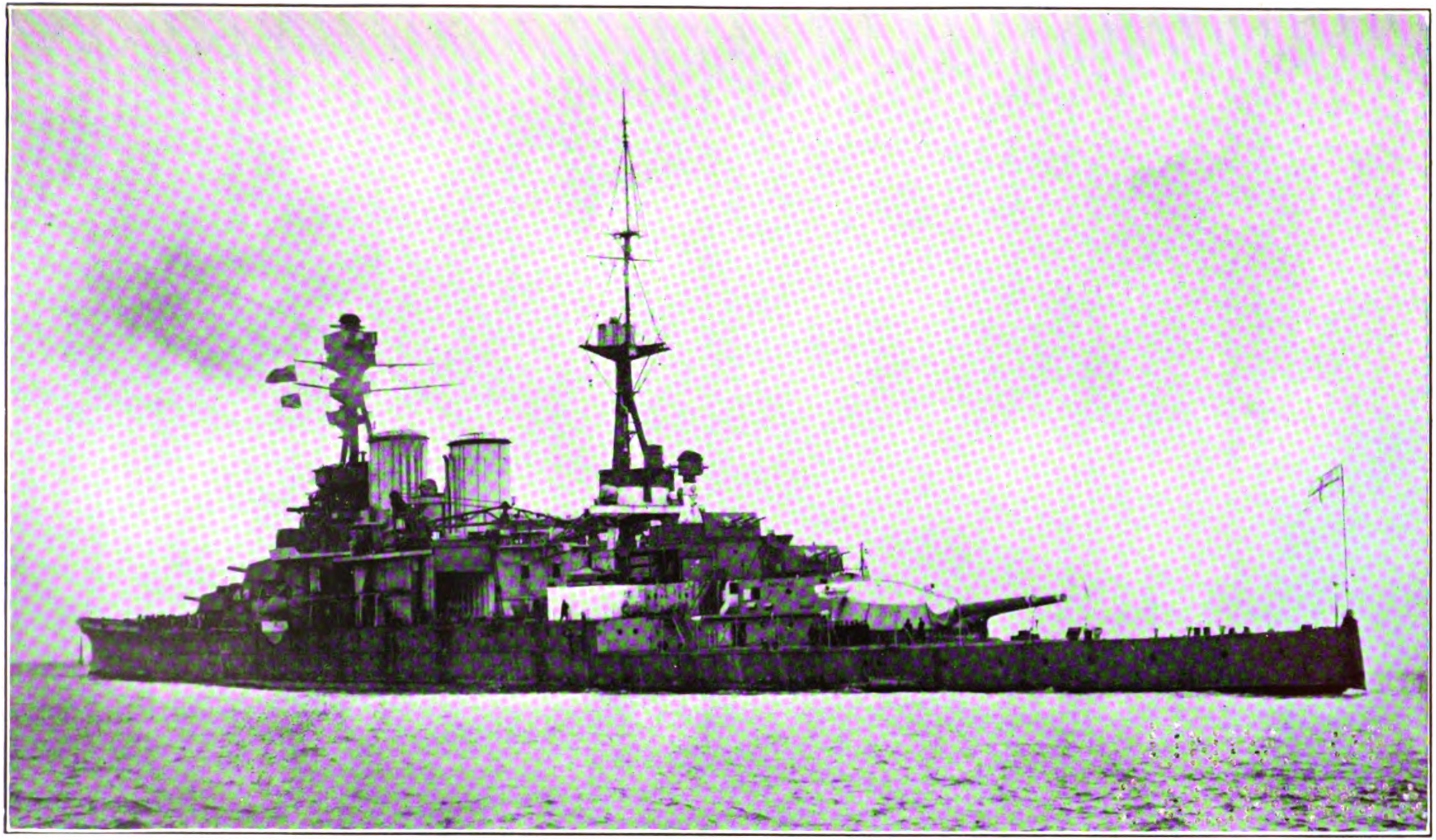
Reports from the Fleet on the working of this system of victualling had been received at various times, but being contradictory they were not helpful. In 1870 an Admiralty Committee had reported as their general conclusion that the system was approved by the Navy, but they confessed that among themselves, in consequence of the peculiarities of the system, they were unable to agree as to its general operation or to any scheme that would be preferable to it. Each member submitted a separate paper giving his own views, and one of them set out the many disadvantages very fully, although this one reads rather strangely :—" It encourages smoking, especially in the younger, to allay hunger when insufficient nourishment is taken by them." The extension of the canteens and the large amount of Savings paid became so pronounced that a Committee was appointed in 1900 to examine the situation : they were to go into the questions of the ration, the canteens, and meal hours. But they were handicapped at the start as they were forbidden to look at the system of Savings, which had an existence of over one hundred years, with a view to its abolition, neither were they to consider the question either of the abolition of the canteens, or of their management being placed directly under Government.

I am sure that at this time there was a feeling among the newer generation in the Navy that some better system could be evolved, but undoubtedly there was also a body of opinion, perhaps mostly among the older men, that might be expressed as a preference, to quote Shakespeare, to "rather bear those ills we have than fly to others that we know not of." That the Committee felt hampered in their consideration of the matter is evidenced by their statement that " so long as Canteens and the Savings system exist the framing of an ideal ration is rendered extremely difficult if not impossible." That brings me to the first stage of what I will call our advance.

Revised Savings System of Victualling.

The Committee, finding themselves thus limited, tried to introduce more variety into the ration, and the changes from the former system may be briefly summed up.

Additions to daily ration : Tea, ⅛ oz. ; sugar, 1 oz. ; corned beef or other preserved meat, 4 oz. ; fresh vegetables, ½ lb., with fresh meat ; raisins, ½ oz., with salt beef or



[Photo by Cribb, Southsea.

H.M. BATTLE CRUISER REPULSE.

Commissioned for Trials and Service after Reconstruction, January 9, 1936.

preserved meat; condensed milk, ¾ oz.; jam, 2 oz.; coffee, ½ oz.; compressed vegetables, 1 oz., with salt or preserved meat.

Reductions in daily ration: Chocolate, ⅜ oz.; fresh meat, ¼ lb.; salt pork or beef, ¼ lb.; preserved meat, 3 oz. Oatmeal to be abolished except for stokers.

Comparing this with the earlier ration it will be seen that jam, coffee, condensed milk, and compressed vegetables were new items. As regards preserved meat there was to be a daily issue of 4 oz., but the alternative issue in lieu of fresh meat was reduced from 12 to 9 oz., leaving a net addition of 1 oz. When this revised ration was brought into force it was decided that no Savings were to be paid for condensed milk. This Committee recommended the adoption of meal hours corresponding to what they found to be the usual practice, which meant that the unofficial meal hours previously referred to were now made official.

I will now endeavour to set out this ration in the form of meals to enable a comparison to be made with the former ration:—*On turning out,* a basin of hot cocoa; *Breakfast,* coffee and bread or biscuit; *Dinner,* fresh meat and vegetables, or salt meat, etc., and accompaniments; *Tea,* tea, bread or biscuit and jam; *Supper,* corned beef bread or biscuit. I think that looks a little more attractive and better balanced than was possible with the old ration. The addition of condensed milk was undoubtedly sound. Formerly we supplied sweetened condensed milk to ships, but it was included in the scale of medical comforts and was not available for general use. And if you only knew the trouble we took over those compressed vegetables, only to find later that it was labour in vain, as they were never popular, mainly, I think, because of the trouble in preparing them properly, although we endeavoured to anticipate this by circulating full instructions showing how they could best be dealt with.

IMPORTANCE OF COOKERY.

The all-important subject of cookery was now beginning to assert itself in connection with the question of Victualling, and I regard this as the next stage of our advance. Looking back for the moment, a Committee had reported in 1870 that ships' cooks generally knew nothing about cooking in the proper acceptation of the term, and on their recommendation a School of Cookery was established at Portsmouth in 1873: it was not until 1902 that similar schools were inaugurated at Chatham and Devonport. In 1904 a Committee was set up to examine the question of Naval Cookery. Briefly they said that the fundamental principle of cookery is the proper preparation of food before it is brought to the galley, and this most important duty was entrusted to the cook of the mess who had had no previous training; and that, although trained cooks were available, the inherent mistrust of their incompetent predecessors and want of confidence in the class generally had not yet died out. This, they claimed, was responsible for the growth of an idea—which was still deeply rooted in the minds of the lower deck—that the average seaman was better able to prepare food for the table than the naval cook.

They also had something to say about the Savings system and referred to the tendency, which was now very marked, to leave behind the rations provided by the Service and buy tinned foods instead: and they suggested that the conditions under which the Navy was now being victualled warranted some modern adaptation of a system which, in the main, was practically that which had existed more than a century ago. They really framed a most useful report, and one important recommendation bearing on our subject was the general supply of bakeries in all new battleships and cruisers as well as existing ships of these classes, thus ensuring a daily supply of fresh bread.

That was the position in 1905 when the Committee on Cookery made its report. The 1900 Committee had said that they could not properly deal with the victualling question so long as the Savings system existed, and the 1904 Committee, although appointed to deal with cookery, felt that they had to draw attention to the same matter. Something had to be done as the revised Savings system had not proved a success, and Savings were being taken up for a large proportion of the new items; and that brings me to a further stage in our advance.

STANDARD RATION AND MESSING ALLOWANCE.

In 1906 a Committee was appointed (1) to look into the question of canteens generally, and (2) to consider concurrently whether any simplification of the complicated Victualling and Savings system was possible. Please note the order of the terms of reference, as this was deliberate. There was still a body of opinion that the Savings system was satisfactory, and so it was thought advisable not to make this appear as the main question. However, the Committee had no qualms on the matter, and in their report they reversed the order, giving as their explanation—" for the sake of greater clearness." The choice of the President of this Committee was most fortunate as he was the same officer as had presided over the one on cookery and had therefore considerable knowledge of the subject.

This Committee hit the nail on the head by stressing that the Cooking, Canteen, Victualling and Savings questions were all parts of one problem, viz., the proper feeding of the ship's company, and that all these sections of the problem must be dealt with simultaneously. The question of cookery having been so recently examined, they made their recommendations subject to the condition that the proposals of the 1904 Committee, being essential to any improvement in the victualling arrangements, would be carried into effect without delay. Obviously then, what they had to achieve was to find a system which would do away with the defects of the Savings system, i.e. its want of elasticity and inherent monotony, and would provide the means for meeting the need for variety and reducing the extra expenditure by the individual messes.

There are certain articles which necessarily form the basis of the diet of every household, and with these they built up what they called a Standard Ration; and, to enable the messes to supplement this ration with other articles and so provide the desired variety, they proposed a daily messing allowance, which would vary from time to time with the cost of provisions. This scheme was adopted, and so we said good-bye to the old Savings system without, in my case, any regret.

The Standard Ration as framed by the Committee was as follows :—

Daily : Bread, 1 lb. ; spirit, ⅛ pt. ; tea, ½ oz. ; sugar 4 oz. ; condensed milk, ¾ oz (fresh milk, ¼ pt., in shore establishments) ; chocolate, ½ oz. ; jam, 1 oz. ; fresh meat, ½ lb. ; fresh vegetables, 1 lb. ; mustard, pepper, vinegar and salt as required.

(*Services afloat only :* 4 oz. preserved meat on one day a week in harbour or two days a week at sea.)

When fresh meat was not procurable :—

Alternate days : Salt pork, ½ lb. ; split peas, ¼ lb. ; potatoes, ½ lb., or 1 oz. compressed vegetables, haricot beans or marrowfat peas ; celery seed as customary.

Preserved meat, 6 oz. ; rice, 4 oz., or flour, 8 oz. ; suet, ¾ oz., and raisins, 2 oz. ; potatoes, ½ lb., or alternatives as with salt pork.

Various options were allowed, flour for bread ; coffee for tea ; milk for sugar and vice versa ; pickles for jam ; tinned salmon or rabbit for corned beef.

With the introduction of the Standard Ration came the most important departure from previous practice. In order to give messes the opportunity of spending the messing allowance to the greatest advantage all service provisions (except spirit) were to be available for issue on repayment, the issuing prices (as with clothing) being uniform on all stations. At the same time many additions were made to the service items hitherto stocked.

For comparative purposes let me suggest a day's meals :— *On turning out,* cocoa ; *Breakfast,* tea, egg and bacon, bread ; *Dinner,* meat, vegetables and a pudding ; *Tea,* tea, jam, bread and margarine ; *Supper,* tinned salmon, bread. The Standard Ration as given above has been modified in the light of later experience, and concurrently the messing allowance has been adjusted, but in principle the system remains unaltered. The 1906 Committee did not stop at this and they suggested that, visualising the future, an experimental trial should be made of an even less elaborate system under which the accountant officer would be responsible for the complete feeding of the ship's company, and that introduces us to the final stage of our advance during my period of service.

GENERAL MESS SYSTEM.

The first experiment under this system was started in H.M.S. Dreadnought in 1907. It is rather curious that the old Savings system after its long run of over a century should have been replaced by two systems, and it can be easily understood that the development of the General Mess system, being in an experimental stage, was not unduly pressed. It needed proper accommodation for its successful working, e.g. preparing and serving rooms as well as improved galleys, thus involving structural alterations and expense except in ships building. Nevertheless, some ships voluntarily tried it and received special facilities and assistance. Thus at one and the same time we had ships on Standard Ration and messing allowance, others on compulsory General Mess, and some on voluntary General Mess. In face of that who can accuse us of being tied up with red tape?

After the War of 1914–18 the General Mess system grew rapidly so that when I retired nearly half the Navy was being fed in that way, and we were only stopped from introducing it into destroyers and other smaller ships owing to lack of space. The layman must remember that a man-of-war is designed as a fighting platform and that armament comes first and speed next. In point of fact it is only comparatively recently that we were able to get space for cold storage in destroyers, and without cold storage and other accommodation we do not consider that a General Mess can be properly run.

To complete the comparison I give a day's meals taken from a week's menu of a General Mess ship :—*On turning out*, cocoa ; *Breakfast*, tea, fried pork sausages, bread, margarine ; *Dinner*, mulligatawny soup, bread, roast mutton, roast potatoes, cabbage, chocolate pudding and white sauce ; *Tea*, tea, bread, margarine and doughnuts ; *Supper*, fried fish, bread, margarine. It is, of course, obvious that, in catering for large numbers, a wider variety can be given than when each mess caters for itself.

With nearly half the Navy on General Mess, and all new entries being under this system during their training, we soon found ourselves faced with another problem. Complaints, mainly from foreign stations, were being received as to the marked difference in the mess bills in ships on the Standard Ration system, and a Committee was appointed to examine the matter. They found that one of the causes was the lack of knowledge of the younger men when called upon to act as mess caterers. Having been fully catered for up to the time of being drafted to a ship on the Standard Ration system, they were inclined to take the easy course, and subsist largely on expensive tinned food purchased from the canteen (compare the remarks of the Committee on Cookery). I was told of a witty remark made by a witness before this Committee. He had referred to the prominence now given to education and the extra amount of school in the dog watches, etc., which left men less time, and less disposed, to learn mess duties, and he added "they are not thinking so much of "Pie" as "Pi-Squared." This 1931 Committee reported after my retirement, but I understand their proposals did not affect the principle of the Standard Ration system. They introduced a "zone" system which permits of a variation of the messing allowance, and provided further additions to the Government articles available for issue on repayment, with, of course, the advantage that gives of lower prices.

THE SUPPLY OF SPIRIT.

The allowance of ⅛ pt. was fixed in 1850, and is still in force. It is not issued to officers, and they are not allowed grog money in lieu. For the benefit of the layman I may explain that while in the scales of victualling we speak of spirit, actually we supply rum slightly below proof strength, and when watered down on board ship for issue it is known as grog. Hence the term grog money, which is a payment to those who do not wish to take up the rum ration. Under the old Savings system sugar and tea or chocolate could be drawn in lieu of the money allowance but this option was seldom exercised. The allowance, being small, not infrequently led to some trading, as a messmate was probably ready to strike a bargain, although the regulations forbade this. The 1906 Committee recommended an increase in the money allowance to encourage temperance. I do not know what evidence was before them as to the need of this encouragement, but I suspect that it was also hoped to stop trading, which was difficult to detect. The money allowance has been further increased to promote temperance, and the numbers drawing grog money have steadily grown for some years, but personally I regard the preference for grog money as reflecting, in the main, the social habits of to-day.

OFFICERS' VICTUALLING.

The victualling of officers is officially the same as the men, but they are given the option of receiving the cash value in lieu. This is known as victualling allowance, and in practice they all receive this payment and make their own arrangements for messing.

THE QUESTION OF CANTEENS.

It will have been gathered that under the Savings system a canteen was essential to provide messes with the variety that the official scale lacked, although their general introduction only seems to date from about 1877–78. When I first became acquainted with the subject there were two systems in force, one being officially recognised and the other not. The former was known as the Co-operative or Service system. This was run by a committee elected by the men under two executive officers as president and vice-president. The committee chose a manager and a secretary who were paid. In most ships the committee were paid and in all ships the servers received payment, while the whole ship's company participated in the profits, either in the form of discount on mess bills or of contributions towards various objects. In passing let us note that the latter included the purchase of mess gear (crockery, etc.), and oilskins for boats' crews. With the increase in the size of ships, and the larger complements necessary, it is obvious that the turnover in these canteens involved large sums of money, and the running of them threw an increasing burden on those of the ship's company elected for that purpose.

This probably led to the unofficial system which was known as the tenant, contract or bumboat. Under this system the canteen was let out to a tenant, who maintained at his own risk a shop on board ship, provided his own staff and undertook that the ship's company should enjoy the same benefits as they did under the Co-operative system. There was still a ship's committee, but their duties were limited to safeguarding the purchaser's interests as to price and quality of goods supplied, and to voting the distribution of the rent. The 1900 Committee on Victualling recommended that this system should be officially recognised.

Abuses were not unknown under both systems. For example, the discount on mess bills, in many cases, appeared to be regarded as a personal perquisite to the mess caterers, who consequently were tempted to take less interest in the economical running of the messes, and prospered in proportion. The report of the 1906 Committee on Victualling and Canteens led to the abolition of these two systems, and to the adoption of a Modified Tenant system under which the Commanding Officer received from the Admiralty a list of contractors and selected a firm or left it to the Admiralty to arrange. The tenant paid so much per man per annum as rent on a sliding scale, which varied with the ships' complements: and this rent constituted the ship's fund, which was administered by the committee elected to supervise generally the working of the canteen.

I had always considered the official attitude on the supply of mess gear, which was limited to basins and plates, as indefensible, and it was with much satisfaction that I read the recommendation of the 1906 Committee that, in future, the Victualling Department should be responsible for providing all the mess gear. In parenthesis I can add that following this we also took over oilskins for boats' crews. Since the cost of these articles had hitherto come out of the canteen trading, it is not surprising to learn that a tenant under the former system had to take into account, when estimating his overhead expenses, not only his rent, wages of staff and discount, but the cost of supplying table covers, crockery, furniture for mess decks, etc., and Christmas presents!

The Modified Tenant system broke down during the War of 1914–18 owing to the difficulty of getting supplies and staffs; so, with the establishment of a Canteen Board for the Army, this service was enlarged to include the Navy, and became the Navy and Army Canteen Board. When this body was wound up after the War the present Navy, Army and Air Force Institutes were incorporated, and took over the work. The Navy has four members on the Council, including the Director of Victualling, and a naval accountant officer is the Manager of the Naval Canteen Service. Representatives elected yearly by the men of the Fleet are attached to Headquarters and so we are really back to a Co-operative system, but with this important difference, that it is centrally managed and operated for the benefit of the Navy as a whole, with the further advantages of a supply organisation dealing with the three services.

I have sometimes been asked why, if abuses were found to exist under the earlier canteen systems, the Admiralty did not take over the business and run official canteens? I had asked myself the same question, and found the answer in the stringent financial rules to which every Government department must conform. The success of the canteen business depends on a readiness to meet every whim and fancy of the customer, and as the conditions under which the

Government buys and sells practically deprive it of any outlets for articles which go out of favour or which otherwise become surplus, whilst outside organisations possess such outlets and depend upon them for minimising their losses, we could not hope to achieve the full satisfaction that is now given.

The above review shows how the Navy victualling has steadily improved, but I have still another question to ask. Can the newer generations appreciate the improvements over earlier conditions of which they themselves have had no experience? Perhaps not, but those who are interested may appreciate the opportunity to read about them.

W. E. Clayton, O.B.E.
Late Assistant-Director of Victualling.

NAVAL AIR
SECTION

CHAPTER VIII.

BRITISH NAVAL AIR PROGRESS.

I. POLICY.

THE application of flying to naval uses is becoming recognised as the outstanding new factor of the present era in sea warfare. It is important that it should be understood that this fact does not lead to the abandonment of the general principles of naval strategy, which have held good throughout history whenever and wherever the objects of that strategy have been the maintenance of open communications by ship.

No former phase in the development of ships or instruments of naval war has altered those principles, and there is no probability that aviation will do so either. One might indeed have expected changes of principle, if any were to come, from the revolutionary effect upon ship construction brought about by the use of armour protection, or from the even greater transformation when steam swept masts and sails out of existence. Some air enthusiasts have attempted to build up so fanciful a picture of revolution in the principles of strategy, and of the consequent ineffectiveness of armies and navies, that a proper appreciation of the present position has been delayed by sheer reaction against these exaggerations.

Another factor has also brought about a tendency, particularly perhaps in the Navy, to resist rapid changes in material or method to meet new conditions. This factor is the removal from the older Services of practically all of those naval and military officers who had had before 1918 any useful experience in the development and practice of flying under naval or military conditions. After removal from their former spheres, these experienced officers had to direct their energies to the organisation and development of the Royal Air Force. They were, therefore, no longer in a position to give their attention to the problems of air work within the Army and Navy. British backwardness in the provision of air forces for the work of our Navy, as compared with those of the other principal naval Powers, is perhaps largely attributable to this cause.

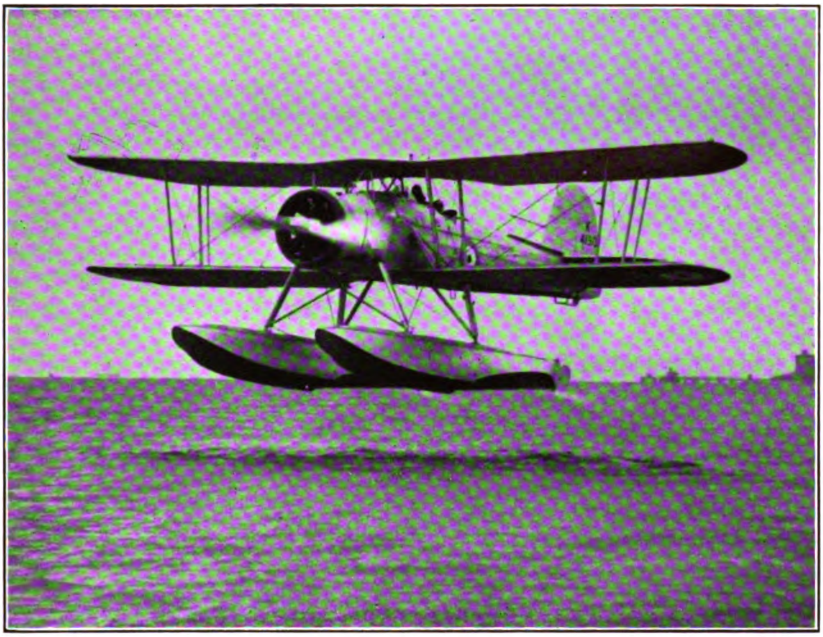
But thanks to a policy which has been followed by the Admiralty ever since that loss was first realised, and which led directly to modifications in the unified Air Force principle by the establishment of the Fleet Air Arm (an arrangement allowing naval officers to fly aircraft in the R.A.F. units embarked in H.M. Ships), there is now a strong representation of experienced pilots and observers among naval officers. Naval air work during the past ten years has, moreover, cultivated an active understanding of these questions amongst all ranks of officers in the Navy. To this fact is due the great measure of expansion in numbers and improvement in equipment which is now taking place in the Navy.

The evolution of to-day in the navies of the world is not leading them to change the main constituents of their naval forces, but it is leading them rather in the direction of adding to their equipment. The reconnaissance aeroplane does not *replace* the cruiser; on the contrary, it permits the more effective use of cruisers. Any ship which the reconnaissance aeroplane finds must be safely approached and examined, and if necessary, attacked. With the aeroplane's higher speed, potential commerce raiders may thus be found by any one naval unit at greater distances apart than hitherto, and consequently, more widely dispersed naval surface forces will be needed if full advantage is to be taken of this extended reconnaissance.

The spotting aeroplane extends the effective range of gunfire, and shows the need, therefore, for a longer range gun. The threat of the bomber, like that formerly offered by the introduction of the breach loading gun, calls for heavier protection and consequently greater displacement of ships. The presence of the aircraft carrier—essential for housing and giving the widest mobility to these aircraft—adds to, rather than detracts from, the necessity for the capital ship upon which its ultimate survival at sea solely rests. The tendency, in fact, which the appearance of the aeroplane has produced in naval warfare is not the elimination of H.M. ships but the need for better and stronger ones, and there seems every probability that this process will continue, as it has done with every maritime innovation in the past, so long as the sea is used as a highway.

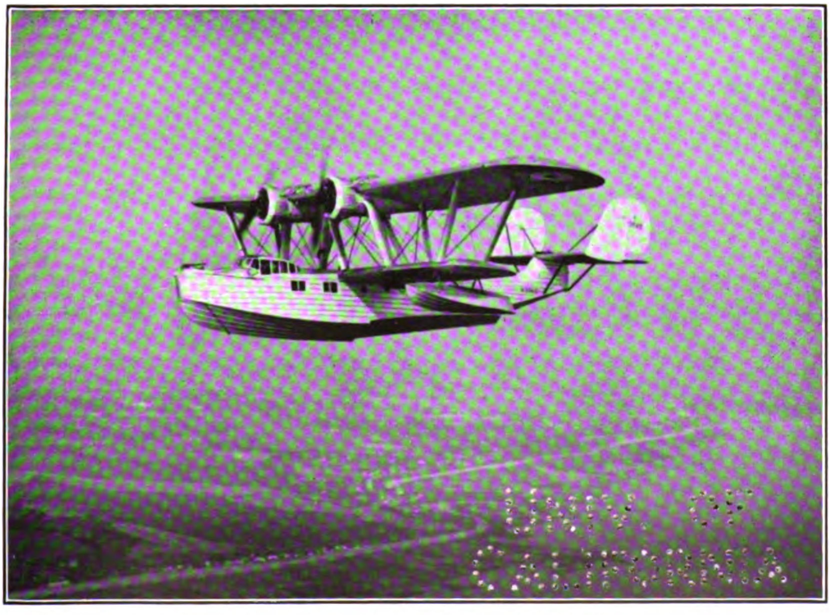
Much is heard to-day of the so-called rivalry between the aeroplane and the battleship, and the opinion is often expressed that the day of the battleship is doomed. Amongst those who incline to the latter view may be counted many airmen of experience and repute and not a few writers on naval subjects. These critics would appear to believe that the potentialities of the aeroplane are being underestimated by those responsible for our defences. They often make claims deduced from incomplete or inaccurate data. It is, nevertheless, a matter of vital importance that when any new factor in naval warfare which may alter the value of the existing components of the "standard" fleet appears, the matter should be seriously investigated.

It is not a fault characteristic of the Navy to overlook such an investigation. When, during the latter part of last century, the practical torpedo first made its appearance, it was predicted by many critics that the heavy ship would be driven from the seas. Small and fast torpedo boats, they said, would be all that a nation would need to secure adequate control of coastal waters. The position was, in fact, very similar to that now brought about by the practical development of the aeroplane as a striking weapon. To meet the torpedo boat menace, the Admiralty did three things. First, they *armed* against it, by providing special quick-firing guns and searchlights; secondly, they *protected* against it by providing torpedo nets, higher speed, and greater structural immunity (later "bulges"); finally,



THE FAIREY SWORDFISH TORPEDO SPOTTER RECONNAISSANCE BIPLANE.

Bristol Pegasus Engine.



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THE SARO LONDON FLYING BOAT.

2 Bristol Pegasus Engines.

they *modified fleet tactics.* The battleship did not disappear, it became larger, more costly and more important. The torpedo boat became a useful adjunct to a battlefleet, but—and this is important—neither its absence nor its presence altered the general value of the capital ship as the ultimate decisive factor in naval war.

Even as, in the past, the rivalry between the gun and the armour plate, or between the torpedo boat and the ironclad, marked but a phase in the development of the main fleet unit, so it is evident that the rivalry between the aeroplane and the battleship is but marking another phase in its evolution. This evolution is inevitable and it is gradual; and that stage attributable to air developments has already begun. In every navy similar steps are being taken and the same kind of progress is being recorded. First (1914) came the high-angle mounting of small guns and machine guns. Later, greatly improved guns and anti-aircraft control arrangements. Now, we have special anti-bomb decks which in recent designs are calculated to keep out the heaviest bombs likely to be dropped by any aircraft at a reasonable range from its base. And while the accuracy and effectiveness of the aircraft armaments are now reaching a high pitch, so also are the tactical measures of defence being developed. The aerial attack may certainly be a rather one-sided game when the target is an inert building or an aerodrome, but when it is a little fleck (as seen from the air) on a vast sea, possessed of great mobility, no little cunning and considerable ability to hit back, and when its least change of movement (if not accurately anticipated) may prove fatal to the bomber's aim, then the game is no longer one-sided and it becomes one of definite values and chances to either combatant. Put into the language of naval tactics, each stage in the development of bombing on the one hand and of the battleship on the other will give a sort of ratio, for any given set of circumstances, between the accuracy of bombing and the accuracy of the anti-aircraft fire. Upon this must be imposed two more factors before any results adverse to the battleship can be determined; these are the nature of the bomb and the vulnerability of its mark at the place of impact.

Now it is not difficult to see that for every combination of circumstances generally affecting the issue there will be a balance between the bombing force and the fleet; a numerical equivalent between aircraft squadrons and ships might, in fact, be obtained. It might be demonstrated, for example, that if 4 battleships in column at sea were attacked by 4 squadrons of bombers, the chances of the bombers being able to hit and damage the battleships were about equal to the chances of the battleships being able to drive off the bombers without receiving damage—this, of course, within practical operating range of an aerodrome suitable for such bombers. If this were proved, then it could reasonably be deduced that an attack by more than 4 bomber squadrons (providing that these attacks were simultaneous and did not interfere with each other) would begin to produce results which on the average were adverse to the battleships; or, conversely, that if there were more battleships, or if fewer bombers attacked, it would become more likely that the latter would be driven off without achieving anything. It might then be affirmed, with reason, that one has only to get enough bombers to ensure the destruction of the battleship, or, in practical warfare, to ensure its exclusion from a given sea area.

But such a line of argument was precisely applicable to the torpedo boat menace also. It might always have been quite true to say, for instance, that 100 torpedo boats would have sunk one of the old battleships (even though with some loss to themselves). It would not have been true to say that the battleship was therefore doomed. It was not, in fact, doomed nor its ultimate superiority even seriously challenged on that account. There were other factors of preponderating importance which bore upon the practicability of bringing sufficiently large numbers of small attacking forces to bear upon one single target, and these, in the long run, invariably governed the situation. History has shown us that the resulting tendency is towards the larger capital ship. History has shown that the torpedo boat menace, like many other inventions, has merely produced a further stage in the evolution of the capital ship in the development of tactics. The general inference is that while aircraft do constitute a practical method of attacking surface warships, they only become a serious menace when their numbers, range and striking power exceed some arbitrary figure in relation to the defensive equipment of those ships.

The results of the practices and investigations of the two Services concerned, namely the Navy and Air Force, are not available in detail for study by the public. But the following facts are now well known and their bearing upon this problem is self-evident.

Location of Warships by Aircraft.

(i) The location of ships is an operation requiring a relatively large number of specialised aircraft. It involves the carrying of heavy petrol loads and special equipment, and this mitigates against such aircraft having much effective striking power.

(ii) The areas in which ships can be located by shore-based aircraft are comparatively restricted. Location cannot be made, on an average, during more than one half of any ship's voyage owing to darkness; consequently, warships will usually carry out a great part of their movements unseen for this reason. A further large restriction is caused by weather unfavourable to aircraft search but not so to warships' movements.

(iii) The consequence of the two above factors is that if dependence is placed upon shore-based aircraft for the location of enemy ships—firstly, very large numbers will have to be so employed, and secondly, the open sea routes will remain practically unwatched, while even those near to belligerent aerodromes will be traversed by ships from time to time without detection.

(iv) As soon as aircraft-carrying ships are made use of in order to enlarge the scope of the aircraft search, then the carrier becomes a target for an enemy ship and progressive stages of attack and defence by naval forces lead back to the battleship again as the decisive factor.

ATTACKS BY AIRCRAFT.

(v) Attack can be carried out at distances from the air base which vary inversely with the weight of bombs which it is intended to use. Large aircraft have a higher capacity in this respect than smaller ones, but, on the other hand, they need more petrol for a given range.

(vi) For reasons given in (i) above, aircraft with large bomb loads cannot search. They may, however, on occasions be able to attack a fleet in harbour, and thus dispense with search.

(vii) The advantage of harbour attack will not always lie with the attacker. Geographical conditions, or well organised patrols, will perhaps permit sufficient warning to the attacked to enable him to prepare conditions to his own favour. The use of smoke, the dispatch of intercepting fighters, the preparation of all anti-aircraft measures, even the putting to sea of the ships, may be achieved.

(viii) Bomb sighting has made considerable progress since 1918, and the accuracy of bombing may be further improved by new methods of delivering the attack, viz., Dive-bombing—from which a great deal is expected when suitable aircraft have been evolved.

(ix) In general, the very factors by which accuracy of aim may be increased increase the danger from anti-aircraft fire. For example, when bombing from a height it is necessary for the aeroplane to steer a steady course ; the longer she is on this course, the more likely is her aim to be accurate, *but* the more likely also are the gunners to find *their* mark. Or again, if greater accuracy is sought by releasing the bomb much nearer to the target, as in dive-bombing, then again the greater the deliberation of the approach, the nearer and easier will be the target for the gunner.

RESULTS OF BOMB ATTACKS.

(x) The conditions for bombing are rarely less difficult than those for gun aiming—they are often more so. The ship is a steady platform and can carry large and accurate instruments ; consequently it is not to be expected that, in general, accuracy of bombing will be greater or even as great as accuracy of gunfire, as against another ship. War experience has shown that it takes many rounds of shell to secure one hit in normal action conditions. It is therefore reasonable to suppose that at least similar numbers of bombs will miss their mark. A ship can go on firing, again and again, whether it misses or it does not ; but an aeroplane cannot. It releases its load and then has to return, say, 300 miles and back before it can deliver its second salvo !

(xi) Make a comparison therefore between these two methods of attacking a battleship, first by another battleship and then by bombing. It will take 25 aeroplanes of the largest size to release as many as 50 bombs comparable in effect to the heavy shells. The battleship, on the other hand, may fire 50 heavy shells, and if by then she has done no vital damage she may continue for hours pouring out regular salvos of heavy shells until the task is achieved.

(xii) The battleship's projectile weighs over 2,000 lbs. The heaviest bombing aircraft of to-day do not, as a rule, use bombs of that weight because they cannot carry them any great distance. 1,000-lb. bombs are the largest normally considered and even then only one apiece is likely to be used when the attack is made at any considerable range. Two of 500 lbs. would, in fact, be more normal.

BATTLESHIP ARMOURED PROTECTION.

(xiii) Battleships are all now being given protection against plunging fire and bombs, on a scale comparable to that only formerly given against direct attack from guns at short range. During the War, battleships were able to suffer punishment from direct hits by heavy shell, and even plunging hits, for a considerable time without vital damage. As many as 40 hits were on occasion sustained before a ship had to leave the line.

(xiv) It is therefore reasonable to suppose that the modern battleship will be able to endure considerable punishment from any of the bombs with which they are likely to be attacked in the ordinary circumstances of a future naval war.

(xv) Progress in the investigation of the bomb *v.* ship protection problem (like that of the gun *v.* armour) is being made by all the principal naval Powers, amongst whom the only indication of change of policy is in the direction of a return to the policy of the heavy ship.

AIRCRAFT POWER EXAGGERATED.

Among the foregoing will be found many facts which too hasty or too superficial a review frequently overlooks. Hence, it is not uncommon for conclusions to be drawn in which the bare fact that a bomb, if sufficiently large and luckily placed, might cause the disablement or destruction of a battleship has a preponderating influence. In this summary, it has been attempted to show that aircraft, like any other machine of war, are only capable of exerting a limited power within a limited range, even when no strategical measures are taken against them. The broad idea of a fundamental rivalry between sea power and the air is reduced to two immediate and intimate aspects, the rivalry between the design of the bomb and the construction of the ship on the one hand, even as it was between the gun and the armour plate, and between the aeroplane and the anti-aircraft gunner on the other. It is only at these points that there is violent contact or any real trial of strength.

Within our field of experience and knowledge there is every evidence to show that these rivalries will continue. They will cause sometimes a modification in the design of the ship or in the system of its anti-aircraft control, and sometimes a change in bombing tactics, bombs or aeroplane design ; but there is no evidence at all to indicate that any naval Power with sea communications to protect will find it to its advantage to abandon its battle fleet.

Finally there is a belief that in the circumstances of a naval Power having bases within air bombardment range of another

Power, the former will no longer be able to use those bases for its fleet. This belief would appear to indicate a very passive resignation to a somewhat doubtful danger. As has been shown above, even should no active measures be taken to interfere with the occurrence of the raids, the actual amount of risk to be faced by the fleet in harbour is a calculable figure and not necessarily very large. Though we may not have experienced such raids, we know their limitations, and on the showing, these, against a well equipped modern fleet, would have to be carried out in very considerable force and with great frequency to have any chance of obtaining important results. But what of the offensive power of the Fleet ? Why should one be content to sit and be bombed ? Why should we not gather our own naval and air forces together and carry out offensive operations against enemy ports and harbours and coastal air bases, for whose defence the enemy, having less naval strength, will have to concentrate considerable local force and effort ? Such attacks would probably compel the enemy to replace many of his long distance bombing planes by units more suited to local defence, and interference with our naval operations elsewhere would be correspondingly reduced.

A study of how naval tactics and strategy are being affected by developments in the use of the aeroplane seems to indicate three tangible points of importance. First, there is every ground for assuming that any given scale of air attack on ships can be balanced by suitable defensive arrangements. The available evidence seems to show that the present progress in such defensive arrangements has by no means been overtaken by progress in the efficacy of attack.

Secondly, attack by the gun is still, under all general conditions and circumstances of sea warfare, a more promising means of destroying the principal naval units of any enemy than attack by any other single means ; when all weapons are used in conjunction the gun is still likely to play the major part.

Thirdly, that even should aerial attack prove at some later date to be more efficacious and economical than attack by the gun, the principal means of oversea transport will be the ship ; ports and harbours will have to be made use of on every line of sea communications ; the forces upon which both they and the intermediate areas depend for their defence will have to be capable of effective operation against ships at all times and under all conditions ; and the bulk of the supplies needed for the maintenance of these forces will have to be conveyed in surface ships with reasonable regularity and certainty.

These are powerful arguments in support of the indispensability of a strong British Fleet. It is, of course, only a matter of common sense that that Fleet should be of absolutely up-to-date composition and adequately provided with modern air equipment, and that its operation in all parts of the seas where its responsibilities are felt should be made practical and effective by means of adequate and properly defended bases.

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Before passing to a review of the present state of our Fleet's air equipment it would be appropriate to see whether there are any indications of the general influence of air developments on future ship design and the composition of fleets. Obviously, only the most important functions of which aircraft are now capable will exert much influence on present design. We are not rashly going to throw overboard the lessons of years of practical constructional experience for the sake of what is purely hypothetical. Serious changes affecting our principal naval units must only therefore be looked for when there is abundant proof that these are justified.

While there is still any doubt, new developments are likely to be confined to the addition of special vessels (or apparatus) to the Fleet, leaving the main forces unchanged. The present aircraft carrier must still be regarded as a special type of ship in a transitional stage of evolution.

The special features of ship design, resulting from important changes and development in material, have always taken many years to settle down into a new form, and often in the past evolution in the early stages has taken many surprising and diverse side tracks before characteristics of a permanent nature have become adopted. For example, the use of armour plates for the protection of ships against gunfire (which came after the advent of steam for propulsion) caused a complete upheaval in the formerly accepted principles upon which the necessary constituents of a naval force were assessed. For many years controversy raged around the respective merits of such diverse types as ironclad frigates, monitors, heavily armed gunboats and protected line-of-battle ships. All of these types were represented in our own and other fleets, while corresponding developments in gun and projectile construction took place in logical opposition.

Ultimately, the diverse types converged again and became amalgamated into the battleship of pre-War days. One conclusion invariably repeats itself in the history of naval architecture—the fundamental strength of a naval force is a measure of its strength in " capital " ships, these being ships which are capable not only of resisting attack from every class of attacker, but also of delivering the most powerful blows against the capital ships of the enemy.

It may, therefore, be reasonably expected that developments in naval construction which arise from the use of aircraft, both offensively and defensively, will sooner or later bring about major changes in capital ship design. Whether the ultimate form of the capital unit will enable it to deliver attacks by aircraft as well as by gunfire ; whether the aeroplane will actually replace the heavy gun as the principal weapon of the capital ship ; or whether the various factors in the struggle for supremacy between the bomb and the anti-aircraft gun will ultimately give a dominating advantage to the latter will only be revealed by the history of the next half century. But it seems probable that the vulnerability of the existing aircraft carrier to both bomb and gun attack, and the inability of the existing capital ship to exert, independently of a carrier, full offensive power, will eventually be the cause of changes in the design of both these types of ship, and they may become merged into one.

Another direction of evolution in ship design is likely to be brought about by developments in cruiser work resulting from the use of aircraft. In fleet work, the cruiser's main function has always been that of a scouting or screening force. By the use of aircraft, fleet reconnaissance is pushed to far greater distance than formerly, and, because of the present severe limitations on seaplane operation in the open sea, all this work has normally to be done by aircraft from carriers. The latter vessels find their movements, and incidentally design, compromised by no less than four different requirements. These needs are for spotting, reconnaissance, striking and air fighting. The provision of special carriers for each function suggests itself; but the grave consequences to a fleet which the total loss of one such ship, with all of its specialised kind of aircraft, would incur, and the obvious limits to the total numbers of carriers which any fleet can have, have not made this idea a popular one. At present, therefore, the compromise continues. The need to conserve the characteristics of the cruiser in *one* type of vessel possessing good mobility, some striking power, protection against attack by ships as light or lighter than itself, and above all this, the capability of reconnaissance in the highest degree, may finally lead to the cruiser-carrier. Such a type might well meet the principal requirements of trade route as well as fleet cruiser work.

The more immediate future will no doubt be bridged by a period of continued experimental development in various types of aircraft carrier and seaplane or flying boat design, and by cautious progress in perpetuation of the older types of ship. Obviously, comparisons in the economics, as well as the absolute efficiency of the various possible combinations of naval force will have their influence. No one who has studied the controversies involved can fail to realise how much more vital is the issue for Great Britain than for any other naval Power. Treaty restrictions on tonnage or other " qualitative " features of ships may easily have the effect of placing those naval forces which have to operate at long distances from their bases at a definite disadvantage to those which do not. In nearly every circumstance of possible war, this disadvantage would therefore be suffered by Great Britain. Restrictions on the use of aircraft as adjuncts to naval forces, and on the size, numbers, or types of ships carrying aircraft, are also most liable to act against us. Moreover, the application of present day definitions in these limitations may have the result of preventing logical development in ship design and, by causing the perpetuation of obsolescent design, may actually defeat their own object, which is economy of defence.

It is too early, however, at the time of writing, to predict what terms of limitation will finally be agreed to. It can only be hoped that no limitations on construction will be accepted by this country if they can have the effect of restricting the capability of naval forces to operate aircraft, without a corresponding and effective restriction being imposed upon the use of aircraft for naval purposes when operated from *shore bases* also.

II. RECENT PROGRESS IN EQUIPPING THE FLEET.

Progress is being made in the equipment of the British Fleet with aircraft, but it does not appear to be keeping pace with that of other naval Powers. The cause of this is not evident, although some excuse for what can only be described as running a serious national risk in this respect may be found in the preoccupation of the Government with home air defence problems.

Exact comparisons with other naval Powers are not easy since it is not possible to obtain precise figures. In numbers of ship-borne aircraft Great Britain is definitely still far behind the United States and Japan, but the disparity is considerably larger than the figures alone represent. Those countries, as well as some of the other European naval Powers, place at the disposal of their navies large numbers of flying boats, seaplanes and shore-based aircraft which are both sufficiently mobile and adequately trained to be capable of inclusion in their total naval strengths. The number of such aircraft which could be counted as effective for co-operation with the British Navy is still extremely small, nor have they the appearance of being very up-to-date in type or performance.

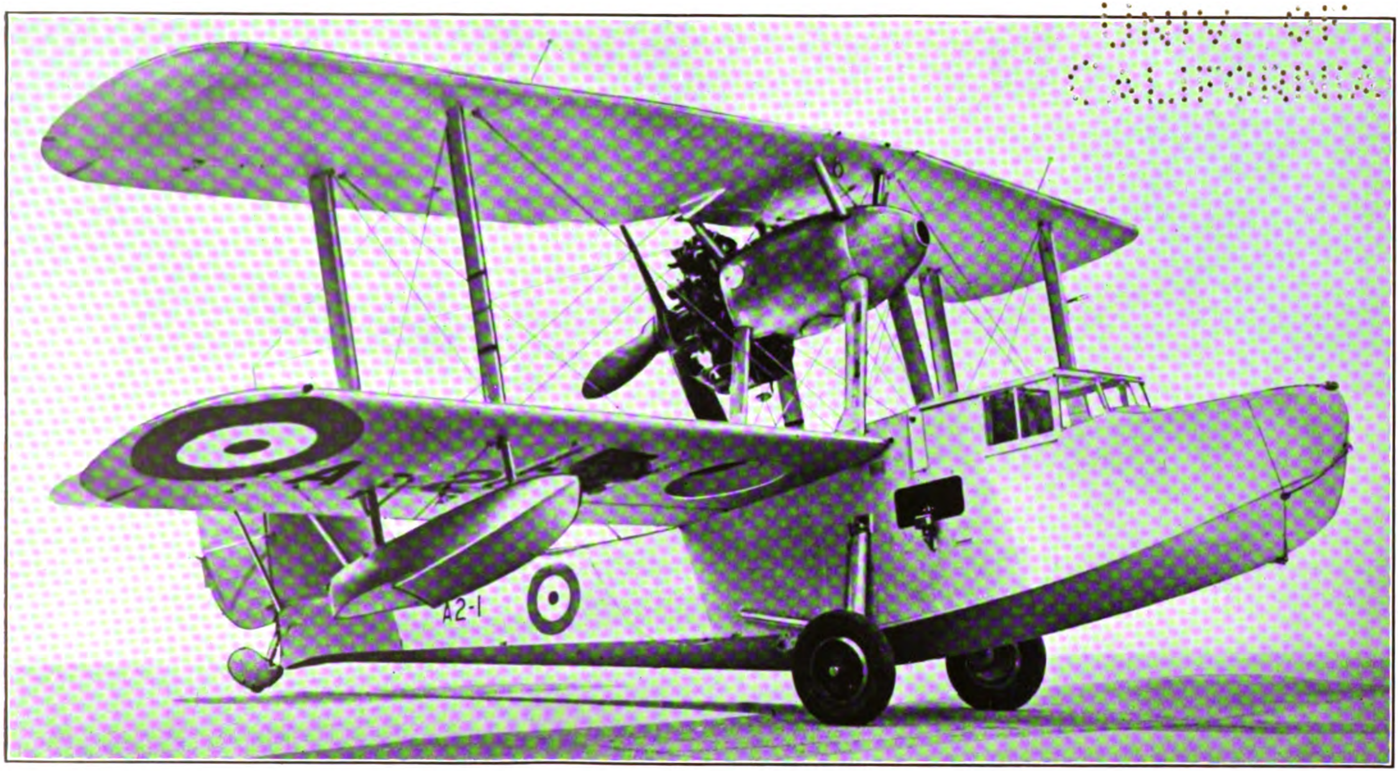
The estimates introduced in March, 1935, allowed for an addition to the Fleet Air Arm of 1½ squadrons (19 aircraft) which should bring the present total to 190 aircraft. It is noted that this number is not yet officially recorded as being in service, and there are a large number of effective fighting units in the Fleet which are still unequipped.

The totals of carrier and catapult ship aircraft in January, 1936, were as follows :—

Carriers	144	Total . . . 179 aircraft.
Catapult	33	
Nelson and Frobisher (without catapults) .	2	

It was expected that the discrepancy of 11 short of the authorised total would be made good when certain catapult ships, undergoing refit or completion, returned into service during the spring of the present year.

Compared with the British total, the numbers shown in the Foreign Fleet Air Arm Section of this manual are imposing. Our weakness may reflect the general desire for economy which has for many years past been responsible for a gradual reduction in the effective power of our Fleet; or it may be due to a lack of conviction on the part of the naval or air authorities as to the need for equality with other naval Powers in this respect. As in the more widely publicised question of the Air Defence of Great Britain, both of these causes are likely to have played an important part. A recovery from our weakness in air defence, however, has been approached, it seems, with the maximum determination and energy of which the responsible Department is capable, and there is ground for confidence that considerable progress will be made in that direction during the next few years.



UNIV. OF CALIFORNIA

THE SUPERMARINE SEAGULL AMPHIBIAN FLYING BOAT.

Supplied to the Australian Navy, and to H.M.S. Nelson.

Bristol Pegasus Engine.

The circumstances under which the Fleet Air Arm is administered are not, on the other hand, favourable either to rapid growth or efficiency compared with any Service administered by a Department which is also responsible for its operation. In this respect it must be accepted that the British naval air units will always be at a disadvantage. From the date at which the R.N.A.S. was severed from the Royal Navy and amalgamated in the general Air Force of Great Britain, our naval air arm has fallen from the position of largest and best equipped in the world to the third or fourth place. Considerable efforts have been made by the Admiralty from time to time for the recovery of a greater degree of control in order that the lost ground should be made good, but it seems that prior consideration has always been given to the political objections to a reversion to the former arrangement. Unless, therefore, a change of policy takes place, what recovery is possible will have to be made under the initial handicap of complicated, and consequently clumsy, administrative auspices.

As in numbers, so also in kind, is progress less promising than was expected when the authorised additions of March, 1935, were announced. The new types of aircraft—the Shark and Swordfish torpedo spotter reconnaissance aircraft and the amphibian Seagull (now re-named Walrus)—had not made their appearance as service units with the R.N. at the end of the year 1935, although one aircraft of the latter type (which was originally provided for trial purposes) had been in use in H.M.S. Nelson during the previous 12 months.

Of the actual total of 3½ new squadrons which was approved in the summer of 1934 as the quota of Royal Air Force expansion to be allocated to the Fleet Air Arm during the completion of the Air Ministry's programme (by 1938), there still remain three new squadrons to be provided. Under the more recently announced acceleration and increases to that programme, it may be justifiable to hope that a correspondingly increased share will be given to the Navy. The programme of extensive repairs and refits now being undertaken, and the replacement of several of the older cruisers by new construction, should require another two squadrons to be devoted to catapult equipments alone.

AIRCRAFT CARRIER DISPOSITIONS.

By the normal rotation of foreign service commissions H.M.S. Hermes, moreover (now on the China Station), is due to be relieved by H.M.S. Eagle early in 1937, and the change will probably involve an addition of 6 carrier aircraft (21 instead of 15) to the force on that station. The long refit to H.M.S. Glorious was completed in August, 1935, and she returned to the Mediterranean, and the changes in the disposition of the ships of the main fleets which were announced during the summer of 1935, were given effect immediately after the Review.

Other important changes in disposition are the attachment of the new cruisers Arethusa and Galatea (1 aircraft each) to the

Mediterranean and the intended attachment of H.M.S. Amphion (with 2 aircraft) as flagship on the Cape Station and of H.M. Ships Ajax and Apollo (2 aircraft each) to the West Indies.

III. NEW DEVELOPMENTS.

The outstanding addition to the Fleet from an air point of view now in progress of construction is the new aircraft carrier Ark Royal. This vessel will have a tonnage of approximately 22,000 * and it is understood that her complement of aircraft will show a very large increase on that hitherto carried in any British carrier.

She will be the first large carrier possessed by Great Britain to have been primarily built as such. This fact alone should give her great advantages in every respect over those of both our own and other navies which were converted either during or after the completion of their construction for some other rôle. She will also, of course, have the advantage of an original design of flying deck embodying all those features, such as arresting gear, accelerators and night flying equipment which in other carriers have had to be added to an already completed ship. It is anticipated that the ship will come into service early in 1938.

Other items of special interest in ship construction are the arrangements which are being made in new and modernised ships for catapulting, re-hoisting and housing seaplanes. The opinion was expressed in the last edition of " Brassey's Annual " that the catapults and cranes of United States ships were far more shipshape and economical of space than those of our own. It was pointed out that, apparently on this account, the Americans were able to carry a greater number of seaplanes in each ship. It will be interesting to see whether the new large cruisers now being completed will show any marked improvement in this respect. One cannot be but disappointed, however, that neither of the two new smaller cruisers Galatea and Arethusa are equipped with more than one aircraft, presumably because, as in the older ships, their catapults and cranes occupy a very disproportionate amount of space.

Of new types of aircraft the Walrus (formerly known as Seagull) amphibian has now been in use in H.M.S. Nelson for long enough to prove its value to catapult ships. It is undoubtedly better suited for landing in roughish water than are the ordinary types of single engined float planes, and its advantages as an amphibian have been tested on many occasions. The Commander-in-Chief of the Home Fleet has been able, for example, on more than one occasion to visit the Admiralty from Portland Harbour or elsewhere, via Hendon aerodrome, when time was valuable or previous notice short. These aircraft are also quite suitable for reconnaissance and anti-submarine work.

As has already been said, delays in supply to the Fleet prevented the new Shark T.S.R. aircraft from showing their qualities on regular service. It is understood, however, that although the initial

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* Officially published in Cmd. 5038 of Dec., 1935 " Fleets."

batches have been held up, several squadrons will have been re-equipped with this new type from the Blackburn (Shark) and Fairey (Swordfish) factories by the time these lines appear.

AUTOGIRO TRIALS.

In September, 1935, trials were carried out with Cierva Autogiro (Rota) aircraft in deck-landings and taking off from the carrier Furious. Full official details of these trials are not available, but it is understood that they were considered to have been entirely successful in regard to the operations tested. This type cannot yet be considered suitable for adoption to Fleet uses because of its very limited load-carrying capabilities. These are so small that the Rota is unable to deal with the very work, namely reconnaissance, for which its particular attributes of being able to land on or take off from a platform on the deck of any ocean going cruiser make it otherwise most suitable. The weight of an observer, a wireless set, and the necessary navigating instruments and petrol load, are too much for any of the Rotas now in existence.

In the meantime, improvements in seaplane design may be hoped for. It would appear that naval requirements for this type of aircraft would be that it should have a very slow landing speed so that at the moment of alighting on the water the force of impact with any rising wave will be as small as possible. Such a characteristic seems only attainable with very light wing loading factors and this, in turn (because of the limited space which is allowable for the aircraft carried on the catapult of a warship) means that little or no striking power could be carried in conjunction with a large endurance. It will be particularly interesting to note what progress is made in this direction by any of the naval Powers, since the requirement is of particular importance to all ocean trade route defence work.

No particular developments have so far resulted from the trials in landing mats (Hein) which were made recently by the Admiralty. It is concluded that the rather obvious disadvantages of such a cumbersome equipment are proving greater than any ease in the recovery of seaplanes which it might have to offer. It is understood that the trials have been discontinued for the present.

It would appear that the issue will finally lie between the achievement of a seaplane capable of open sea operation and the provision of some type of cruiser carrier for trade defence.

PROGRESS IN NIGHT FLYING.

In regard to new improvements in the operation of fleet aircraft, great progress appears to have been made in night flying, both from the carriers and by seaplanes. This can, no doubt, be attributed more to improvements in flying instruments and blind flying training than to any particular developments in the aircraft themselves or the ships' equipments. The lighting question for carriers is, of course, always a problem. Whatever kind of lights or flares are used they are apt to reveal the contour of the carrier with unpleasant accuracy, and the final answer must be a compromise between helping the pilot and helping the enemy.

Before leaving the subject of technical progress in the F.A.A., mention must be made of wireless controlled target aircraft, or Queen Bee, as it is called. The use of such aircraft for the general improvement in method and training of naval anti-aircraft gunnery was first proposed by the Admiralty more than ten years ago, the intention being to use the same system as had been successfully developed for the wireless controlled battleship targets Agamemnon (1921–26) and later Centurion. There were technical objections, however, in applying the principle to aeroplanes, and it was not until about 1931 that the first Robot aeroplane was available for the Fleet. Since that date the benefits derived from this form of target have been inestimable.

IV. EVENTS OF 1935.

Exercises.

The only large scale exercise of particular importance of which details are available was the exercise of the combined fleets off Gibraltar during the spring cruise of 1935. This exercise was primarily intended to investigate, under the most realistic possible conditions of war, the extent to which modern naval forces are able to interfere with and to defend commerce on a main trade route. The naval surface forces were, as is usual in this type of exercise, fairly evenly balanced in order that no particular strategical bias should deflect the principal focus of interest from the attack and defence of trade.

The main feature of interest, from an air point of view, was the fact that carrier-borne and catapult aircraft were made use of to the largest extent possible in the search for and protection of shipping. This exercise was thus able to provide a new note of interest for the Fleet Air Arm, and its results were most valuable. For several days many of the aircraft from the carriers were flying almost continuously during daylight hours. Practical experience of the strain upon eye, nerve and judgment during the continuous work in the air which this threw upon many of the pilots, observers and telegraphist air gunners, was from all accounts very reassuring. High praise of the efficiency and endurance of their personnel, and the dependability of their aircraft was afterwards paid to the units of the F.A.A. taking part, both by the Commanders-in-Chief of the Home and Mediterranean Fleets and some senior officers of the Royal Air Force who were present as official witnesses.

A lesson of great importance which may also be drawn from the operations was that the strategical and tactical training already given to the Fleet, for duties not hitherto experienced in war, appears to have been conducted upon the right lines, and the performance and capabilities of the aircraft employed on these duties fulfilled expectations. No particular changes in policy are therefore likely to result from the exercise, but the extreme difficulty of operating seaplanes of present types under quite normal ocean conditions was confirmed.

During the year normal training programmes for the carriers have been much interfered with. The absence of the Glorious, while undergoing her large repairs, reduced the large carriers from three to two. Her place was temporarily taken in the Mediterranean by H.M.S. Eagle, whose return home after relief on the China Station by H.M.S. Hermes was interrupted by her temporary attachment to the Mediterranean Fleet from the end of January until April, 1935. During this time she embarked aircraft which had been left at Malta by H.M.S. Glorious.

The usual Summer training period was shortened in order to concentrate the Fleets at Portsmouth for the Jubilee Review, and H.M.Ss. Courageous and Furious were at that time the only two carriers (other than the Hermes) in commission. The sudden development of the Italo-Abyssinian dispute and tension in the Mediterranean resulted in the complete cancellation of the whole Fleet training programme for the autumn. H.M.S Glorious was recommissioned and left the United Kingdom for Alexandria at the end of August, and she was shortly followed by H.M.S. Courageous flying the flag of Rear-Admiral (now Vice-Admiral) The Hon. Sir Alexander Ramsay, K.C.V.O., C.B., D.S.O., Commanding Aircraft Carriers.

H.M.S. Furious remained in home waters and carried out deck-landing training, such trials of aircraft or special work still on hand, and the usual co-operation work with the Home Fleet then at Portland.

AIRCRAFT AT THE JUBILEE REVIEW.

The Royal Jubilee Review provided the public for the first time with an opportunity of seeing a large concentration of F.A.A. units. Ninety or so aircraft belonging to the Squadrons (3 Fighter, 2 Torpedo-bomber and 4 Spotter-Reconnaissance) of the Courageous and the Furious, and those of the Glorious not in Malta, were assembled at Gosport and, after being joined by the seaplanes forming the three Home and Mediterranean Fleet catapult flights, flew past His Majesty on board the Royal Yacht and over the Fleet anchored at Spithead. The timing and precision of the display were excellent and the impression it left was, like that left generally by the whole Review, that the tradition which can produce such a well ordered, efficient and dignified parade will perhaps help to mitigate the meagreness of its material strength when that very weakness will perhaps hasten a challenge.

Events in East Africa and the Mediterranean seem almost to have sounded a direct echo of that thought. Hardly had the Fleets dispersed to their normal stations when a call was made; movements and new dispositions of the Fleet immediately followed, and, for many, the task of meeting a naval emergency began in earnest. It would undoubtedly not be in the best interests either of our national defence, or of the delicate fabric upon which international peace now rests, for any official statements to be made at present about the technical nature of this emergency, or the precautions necessitated by it. But it should be both useful and judicious to review, in terms which could be appreciated by any free student of the situation, how British maritime interests in the Middle East might be affected by air forces in attack or defence. The problem is not merely one of sanctions but war, because military sanctions mean blockade, and blockade, under modern conditions of war, must mean a supreme trial of all the major forces, both naval and air, at the disposal of the belligerents.

The questions which must be answered relate to the fitness of British Forces to meet such a trial, and there will be many with which naval aviation is particularly concerned. Here, we are face to face with some of the fundamental problems of British Imperial Defence. As ever, sea communications are the vital issue; our own and those of a possible enemy. If our own, could they be injured? If so, could our shipping be diverted? If not, then how much of it must be escorted at all costs through the danger zone? With what forces could we meet the threat? As concerns enemy communications, have we the power to blockade, patrol, or offer any resistance to the free passage of his ships? What forces do we need for this? Are they available and efficient? What part would our carriers or our catapult aircraft have to play in such operations? Are they suitable and adequate in number? Should they be supplemented by seaplanes or flying boats working from harbour bases? Have we any such units, and are they sufficiently mobile and adequately equipped? Could we hold our Fleet bases against attack? Have we the aircraft necessary to patrol local waters against the submarine menace? Could our F.A.A. provide for this or have they other prior duties?

These and many other pressing questions will, no doubt, have been asked on account of the present situation. Let us hope that the provision already made against such a menace is adequate, or, should it have been found wanting, let us hope the deficiencies are being properly dealt with.

The relatively small number of aircraft with which the Fleet is normally provided has been commented on frequently during the past year. Nor do official publications indicate any extensive arrangements for the provision of other air units which, by reason of their type and the training of their personnel, could be included in the category of shore based naval co-operation aircraft.

There are many well informed critics who would prefer to see Great Britain far more strongly armed than she now is in these two respects, and who may have good justification for believing that perhaps the fault lies in the system by which the responsibility is now divided. In the days before 1918, all that concerned the security of our sea communications was the direct affair of the Admiralty. The arrangement permitted no evasion of responsibility, no disastrous inactivity owing to misunderstanding as to the actual line of demarcation between two Departments, and little likelihood of the claims of some other national service becoming a handicap to the full development of naval defence requirements. Despite the apparent merits which unity of direction and development in aeronautical affairs may have, fears are beginning to be felt that that system may at the same time be depriving the Navy of its free judgment in what are fundamentally naval questions. It may even be depriving it of the spirit of a unified command so indispensable to efficient training and the successful conduct of operations of war. This question also is one which the present situation may oblige us to examine without prejudice before it is too late.

V. PERSONNEL.

The most notable change in the personnel of the F.A.A. since last year has been the introduction of the new rating of observer's mate and changes in the recruitment and title of telegraphist air gunner. Both changes have been brought about in order to give the lower deck opportunities for more advanced responsibilities in air work than that hitherto only offered by employment as T.A.G., and to open this employment to the seamen and signal, as well as to the telegraphist branches. Under the new system, any seaman, signalman or telegraphist rating of suitable age and physique, who can qualify to a certain standard of buzzer signalling, may join the new Air Gunner branch which henceforth supersedes the old T.A.Gs. Those who after two years service as such can qualify for leading rate in their own branch (or if wishing to do so in the Seaman branch) and in navigation, may be recommended for observer's mate. They will then be taken by roster for courses at the Signal School, Gunnery School and the School of Naval Co-operation at Lee-on-Solent, which are in general similar to those done by observers (officers). This will qualify them for employment in the Fleet Air Arm first as acting observer's mate and, if recommended after two years, as observer's mate—the rating carrying with it "leading" rank. The first of these observer's mates courses was completed by 9 ratings and they were drafted to aircraft carriers for their air duties. The actual responsibilities which these men will be given must, of course, depend to some extend upon the standard which is shown by the early qualifiers when they get to sea. But there is no doubt that a great benefit to the Fleet Air Arm and the Navy as a whole may be expected from the innovation. The present system of two officers per aircraft, in the very large proportion of the air units of the Fleet which is demanded by air reconnaissance and spotting needs, would make a very heavy demand upon the Lieutenants' lists, and one which it is believed is not really justified. Besides this, accommodation in the new large carrier for the very large number of officers which would otherwise be used presents no small difficulty.

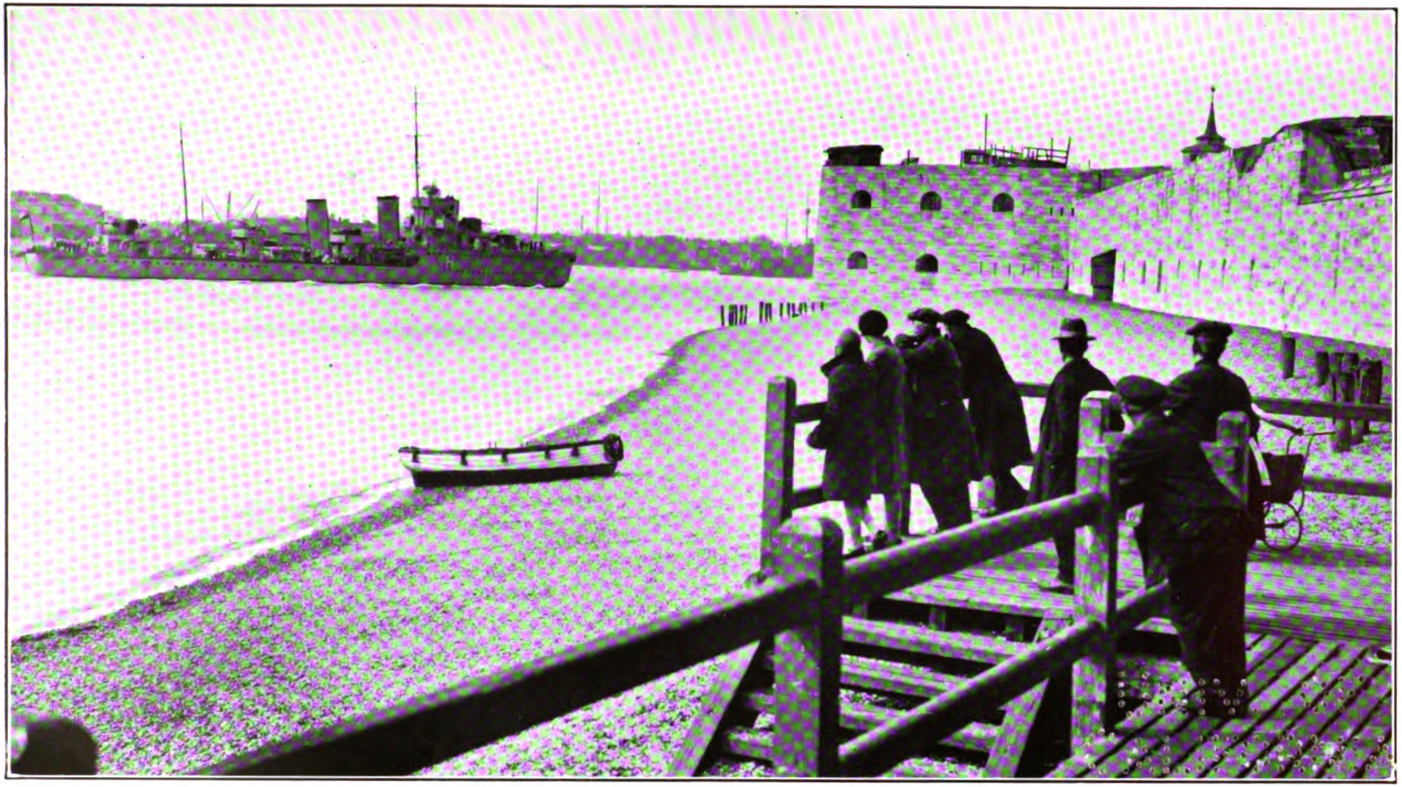
Finally, and by no means least, the Navy has realised that the lower deck is capable of supplying excellent material for many duties demanding similar skill and making similar calls upon judgment and the power of responsibility. There seemed no reason why this new and important branch of naval work should have been cut off completely from the lower deck. The future of these men and their Branch will be watched both in and out of the Fleet Air Arm with the greatest interest. Much surprise has been expressed in both Naval and Air Force circles that a similar opening has not been made for pilots from the lower deck. For some time past both the Royal Air Force and the Naval Air Services of other countries have found in the employment of non-officer pilots a satisfactory remedy for the obviously uneconomical tendency to "over officer" the flying services. As with observers, this tendency produces embarrassment to a fighting service in many different forms while the introduction of non-commissioned pilots in limited numbers seems to offer very few disadvantages.

The Fleet Air Arm has, it is true, already employed a few (some 5 or 6) sergeant pilots in fighter squadrons, but the handicap under which even officers of the Royal Air Force must suffer in their naval employment must be greatly increased in the case of N.C.Os. of that Service. Their entirely non-naval associations and training, which make it difficult for them to be usefully employed on board while not actually flying, and above all, their less ready availability as reserves for the Navy after their initial period of flying duty has ceased, all tend to make their service with the Fleet less welcome both to themselves and the Navy than would be the service of purely naval men. Moreover, there is a feeling on the lower deck that its exclusion from any opportunity of showing its capability at performing this kind of service for the Fleet, while it is readily accepted in other navies, is invidious and not justified by its past history and traditions.

Perhaps the introduction of petty officer pilots is not compatible with the preservation of a truly Air Force atmosphere in the Fleet Air Arm. No one would wish to override the demands of efficiency for the sake of a sentimental claim, and this change, if contrary to Air Force interests, will not be looked for should it become established beyond doubt that naval flying requirements will be better served under Air Ministry than under Admiralty administration.

PROMOTION OF OFFICERS.

Important variations from the normal rules for the promotion of naval officer pilots in R.A.F. rank have recently been made in order to increase the established numbers in the higher ranks. Several officers who had previously been passed over for promotion to flight lieutenant were promoted on a special list, and larger numbers than usual for the year were also promoted to squadron leader. Promotions to the rank of wing commander have also been started.



[" The Times " Photograph.

THE CHILEAN DESTROYER HYATT.

Entering Portsmouth Harbour during a Visit.

It is to be expected, therefore, that naval officers will shortly hold a proportion of the appointments as wing commander in the carriers.

No other changes of note have taken place in the organisation of the Fleet Air Arm during the 12 months under review, and no marked increase in the intake of pilots or observers from the Navy except as represented by the new observer's mate entries who are additional to the observer officers. Nor have any important changes been made in the published training arrangements on shore.

AIRCRAFT CARRIER COMMAND.

The tenure of command of the aircraft carriers by Rear (now Vice) Admiral The Hon. Sir A. R. Ramsay, K.C.V.O., C.B., D.S.O., over the date originally announced for his relief by Rear-Admiral N. F. Laurence, C.B., D.S.O., is explained as being due to the altered dispositions of the naval forces arising out of the international situation. The former completed 2½ years in command at the end of February, 1936.

CONCESSION TO RATINGS.

One outstanding question concerning the welfare of naval ratings serving with the F.A.A. has been settled during the year. An allowance of 4*d.* per day is now paid to those men who are temporarily disembarked for duty at R.A.F. stations in the U.K., during the course of commissioning in Home Fleet ships, as compensation for certain losses of amenity as compared with those enjoyed by their shipmates who can spend the whole of their leave periods at their own home ports. It may very reasonably be considered a hardship that during the greater part of their leave periods (during what counts for Naval though not for Air Force ratings as Home Service, and is frequently sandwiched between long commissions abroad) F.A.A. men have to travel very long distances in order to see their wives and families, live the remainder of the time in what are often very isolated encampments (while their shipmates, though not on long leave, are getting plentiful daily short leave and week-ends in their own houses), and lose many routine privileges such as duty-free tobacco otherwise enjoyed while attached to a seagoing ship.

VI. NAVAL CO-OPERATION UNITS.

An adequate equipment of ship-borne aircraft is as necessary to a Fleet as are modern guns and efficient armour plate, and this fact is to-day almost universally appreciated. It does not appear to be quite so generally recognised that the naval strengths of two countries cannot be properly compared unless all the aircraft units and the strategical bases suitable for their operation, which could be used effectively for co-operation with naval forces in war, are included in the comparison.

In three of the principal foreign navies, namely, those of the United States, Japan and France, all of those air units can be considered collectively as naval air forces, and their strength and relative efficiency computed with comparative simplicity. In the case of Great Britain, however, the assessment is not so easy because there are no shore or harbour based air units which correspond, either in name or in function, very closely with those of the Powers named above. The Fleet Air Arm comprises only those aircraft squadrons and smaller units which are actually embarked as part of the equipment of H.M. ships. Amongst them are included also the unit known as the Gunnery Co-operation Flight, which provides "Queen Bee" targets. No other aircraft at all, whether flying boats, seaplanes, or other special types designated for coastal work against naval forces, belong to the Fleet Air Arm.

After the end of the War, when the R.N.A.S. and R.F.C. had become amalgamated into the Royal Air Force, the coastal stations and aircraft units of which the R.N.A.S. had formerly been composed almost completely ceased to exist. The flying boat, airship and seaplane stations were closed down and practically no further development in either their work or in any of these types of aircraft themselves was undertaken for a number of years. The principal governing the composition and training of all British military aircraft became thenceforward that they should be cemented into one unified Air Service with common ideals, with common methods of training and, as far as possible, with types of aircraft which might be interchangeable regardless of the locality or sphere of interest in which they worked. In theory, it was intended that detachments from the common body should be made as occasion might demand for particular services, including those involving work over the sea. In conformity with this principle, the naval co-operation unit, pure and simple, as it exists in other countries, has never really reappeared in Great Britain. A special departure from the principle of unification did, however, have to be made for the aircraft required to be embarked in H.M. ships, on account of the impracticability of continuing air work from seagoing vessels without specially designed aircraft and specially trained personnel.

Theoretically speaking, specialisation for naval work has ended there, and has not been applied to flying boats, seaplanes, or any other air squadrons stationed near the coasts. Officially, the rôles of these units are diverse, and they are regarded as available as much for general Air Force work as for any special naval operations. Hence, although recent years have brought a certain recrudescence of the *special types* demanded by flying over the sea, the qualifications of the personnel are not specialised, nor are the categories of their duties. Consequently, it is not possible to point to any particular unit and say that such a squadron can be included in Britain's total naval strength. For example, any such unit may, besides being available sometimes for anti-submarine duties, be also included in a reinforcement or general utility category connected with air defence strategy. In the circumstances, the task of the naval statistician is no easy one.

Under these conditions also, it is natural to find that in regard to the actual types of British aircraft which can be considered suitable for naval co-operation, less progress has been made than in other countries. The United States, France, Germany, and Italy, are all ahead of us in the development of the long-range flying boat, the first named having, apparently, made a specialisation of this type for oversea patrol work. The United States, France, and Japan also have made considerable progress in the application of smaller land-based aircraft and seaplanes to naval strategical needs. All three of these Powers have extensive coastal organisations employing very considerable numbers of such aircraft for patrols, utility or training. In England, after a period of several years, during which the development of special naval co-operation types was practically at a standstill, and consequently with much leeway to be made up, interest in these types has revived and many British firms are engaged in the development of large flying boats. It cannot be truthfully said, however, that naval needs have been the real stimulus for this revival. It will probably be found to be more in the recent awakening in England to the special potentialities of that particular type of aircraft for long-range commercial work, combined with high speed and large load carrying capacity, which have been so amply demonstrated by German, Italian, French, and American designers. Beside the Dorniers, the Savoias and the products of many successful American and French constructors, our contemporary flying boats have made but a poor showing in those characteristics. It may even be doubted whether in our limited mail and passenger services our flying boats have shown the regularity or the continued and useful service of those of other countries.

But the fault should not be laid at the door of our British aircraft manufacturer or designer alone. It is more probably to be found in the system of supervision with which an unfortunate overdose of Government control appears to have tied their hands. If this judgment is correct, let us hope that the hands of the trade will be freed again before British leadership as a maritime Power is to a large extent overshadowed by British inferiority in overseas airborne traffic. Special efforts by our designers and manufacturers, coupled with strong financial support and public confidence, will be needed to recover ground which has already been lost. The invasion of potential British fields of commercial air development has now been threatened by more active foreign competitors, and the wheels of the British machine are at last beginning to turn. Given the financial support, the public confidence, the manufacturer's efforts and, above all, a greater freedom from official regulation, then Great Britain has certainly every chance of ultimate leadership again in this new sphere—for she enjoys the unique opportunities and privileges, for every kind of international air development, which her vast shipping organisations have already permanently established all over the world.

To a certain extent, developments in coastal reconnaissance aircraft have followed experience gained in the Navy by the Fleet Air Arm. But on the whole it does not seem that the happier outlook for British flying boat development is quite closely enough connected with British naval strategical requirements to justify too much confidence of early recovery to our proper position in that respect. Progress in naval co-operation air work is still very limited in its scope. Two new types of flying boat, the Saunders-Roe " London," a twin-engined biplane with endurance of some 1,100 miles at something over 100 knots, and the Supermarine " Stranraer," of similar type and very similar performance, represent the latest additions to British military aircraft in this class. There is a new torpedo bomber for coastal work—the Vickers " Wellesley," a single-engined monoplane—which it is expected will replace the " Vildebeest." Finally, but not least—for it promises to represent the biggest advance of all aircraft of its type—there is the Avro " Anson " twin-engined monoplane for general sea reconnaissance duties. This latter should add greatly to the facility of providing efficient reconnaissance in waters which may be covered by flights of limited duration from shore aerodromes. The introduction of this type to replace flying boats for that particular kind of work represents a change of policy which has been anticipated for some time.

More important even than development of material in our naval co-operation service is the achievement of a correct tactical and strategical policy and the application of suitable methods of training. Naval critics are not wholly satisfied that, in even these respects, the arrangements for naval co-operation made at present are as good as they might be. Such information as may be gleaned from reports on the occasional combined exercises in which the Fleet and Air Force take part is not perhaps altogether reassuring. There is a strong tendency to over-emphasise the possible results of bombing, and to understate the case for search, for suppressing the submarine, and for assisting in every possible way the warships whose duties might become all the more arduous and difficult should they be harassed by enemy aircraft. It is probaby true that the very sparseness of our coastal aircraft units, the absence of specialisation for the personnel who serve in those units, and the resulting difficulty of providing adequate experience of naval requirements for that personnel, all contribute to the backwardness of this branch of duty.

The possession of a fully effective Navy, however, is a very real and vital factor in our national life, and its presence is needed everywhere in war. The menace of aerial attack will not diminish the need of ships ; it will probably increase it. But modern methods of war and the extended use of aircraft are insistently calling for larger and more efficient shore- or harbour-based air forces for the assistance of those ships in carrying out their inevitable sea tasks. Therefore, we must see to it that these air forces are provided and always there whenever and wherever the Navy needs them. The stake is the economic existence of the British Empire, not merely in war but at all times, when perhaps in belief of our weakness, political pressure or coercion is brought to bear by some other Power against our national policy. The risk is that while strong, perhaps, in ships, in home air defence, and in readiness for military action, we are weak in this one vital respect, which can be called our naval co-operation forces. This is the joint in our armour, and this is where we may now fail. Perhaps the weakness is because of that very idea—co-operation—with all its divided channels, conferences, combined staffs and other complications. Perhaps, indeed, the demarcation between the tasks of the Air Force and the Navy is not sufficiently clear, or needs readjustment. To guarantee security for our seaborne trade in war, and consequently to establish in peace a defensive organisation of unqualified efficiency, is a responsibility of the first magnitude. The task must be treated with the utmost seriousness; it must permit no repetition of failures; it should leave no room for doubtful schemes of organisation nor for divided opinions on strategy.

Can we be sure beyond any shadow of doubt that the existing arrangement (by which this responsibility is divided) is one which is really giving us the best possible system for providing, and for disposing our naval co-operation units and training them for their duties in war?

VOLAGE.

CHAPTER IX.

FOREIGN FLEET AIR ARMS.

THE Fleet Air Arms of all foreign Powers, whether they are separate services or administered by the Air Force of their particular country, have, during the last five years, been on the increase. The larger Powers, with the notable exception of Great Britain, have during the last two years greatly accelerated their programmes of expansion. On all sides we find the lesser Powers modernising their equipment, improving their bases and generally bringing their Fleet Air Arms into line with their other Defence Services, so that, in the event of war, they will not be found unprepared ; or, what is more likely, in the councils of peace the views of their delegates may at least be taken seriously.

When considering the naval side of aviation, it must always be remembered that it has been almost entirely a post-War development, and, until it is tested in war, its practical possibilities must remain a matter of conjecture. It is for this reason that there are more controversies centred round the world's Fleet Air Arms than any other Services. For instance, there is the carrier controversy. What is the correct size of the carrier to meet the requirements of any particular nation ? There are innumerable considerations, such as the fact that large carriers carry a greater number of aircraft for their tonnage and personnel than the smaller ones—most important in these days of Treaties. Against this might be matched the facts that the large carriers present a better target for attack, both by day and by night, and that in the event of their loss or disablement, a greater percentage of aircraft would be out of action.

Some such considerations as these, it is believed, are occupying the minds of the German authorities ; and though they are in a position to profit by the experiences of Great Britain, the United States, Japan and, to a lesser extent, France, it is understood that no decision has yet been reached.

There are an ever-increasing number of aircraft being carried in battleships, cruisers, and fleet auxiliaries of all sorts in the navies of all countries. The vast majority of these aircraft are of reconnaissance types, with a lesser number of spotters, and still fewer fighters. However, they are all either seaplanes or flying-boats. It is with regard to these aircraft that one of the biggest problems of naval aviation arises. How are these aircraft to land in the open sea that they may be hoisted inboard and replaced on a catapult or other stowage in preparation for the next flight ? An optimistic estimate of the average number of days on which this would be possible, at all events in Northern waters, is two days a week, with whole weeks together, in the winter months, when it would be quite impossible. Innumerable schemes have been tried to get over this difficulty ; not the least interesting of these being the landing mats, which were originated in Germany, and experimented with by other countries, and which are still used by the S.S. Westfalen. But the fact still remains that a seaplane or flying-boat, having flown, must alight, probably in the open sea, and be hoisted inboard again. To do this the ship must stop, or very nearly so, and if she has any motion on her the operation of hoisting renders the aircraft very liable to damage. The only other alternative to this would seem to be to allow these aircraft to land on a carrier and for the carrier to return them to the parent ship as opportunity offers.

At present, when working in anything but the most sheltered waters, the ship-borne seaplanes and flying-boats are " one-flight " aircraft, or, where the parent ship is not fitted with a catapult, " no-flight " aircraft. However, there is no doubt that the problem of the return of these aircraft to the parent ship will eventually be solved as completely as the catapult solved the problem of the take off. Recent experiments seem to indicate that to accomplish this the aircraft will have to be kept clear of the water altogether. Suffice, then, to say that, due to their not having been put to the test of war, the Fleet Air Arms of the world are the least settled of any fighting Services, and when war does come, the most revolutionary changes, strategical, tactical, and material, may be looked for.

U.S.A.

The United States naval air authorities are going steadily ahead with the provisions of the Vinson Act. That is to say, with regard to the expansion programme of aircraft, the United States Naval Air Service will have a total of 1,910 aircraft by 1942.

With regard to the provision of personnel for the U.S. Navy, which includes personnel for the Naval Air Service, Rear Admiral Leahy, Chief of the Bureau of Navigation, made the following statement before a Senate Committee on the Naval Line Bill : " The ships of the treaty navy, including 1,910 aircraft, will require for their line officer complement 5,570 officers, which will include 1,908 aviation officers. This number does not include officers employed ashore, who now number 2,079. It is not proposed to increase the number of officers ashore, except aviators. The aviator force ashore for the 1,910 programme should be increased by 291 aviators ; making a total of 2,370 line officers ashore. Assuming the source of supply of these officers remains the same, this number will not be reached till 1945."

At the Army Air Corps Tactical School at Maxwell Field, Ala., arrangements have now been made for Army aviators to be instructed in naval tactics, with a view to co-operation in naval warfare.

AIRCRAFT CARRIERS.

The carriers Lexington, Saratoga, Ranger, and Langley are in commission. Exercises in 1935 were the first in which the Ranger with her 79 aircraft had taken part. Apparently the Ranger is very lightly built and vibrates badly, and the use of tetra ethyl lead in the aviation spirit has caused severe corrosion in her petrol storage tanks, necessitating dockyard repairs. She is built to hold 7 squadrons of 18 aircraft each, 54 aircraft are stowed in one large hangar and the remainder are stowed on deck. She has three lifts arranged over to the starboard side in such a way that the aircraft can be moved forward along the port side when the lifts are down. The flying deck is about 730 ft. long and 80 ft. wide, the surface being of Oregon pine planks running athwartships. Two sets of arrester gear are fitted, forward and aft. The forward set is fitted so that aircraft can land on from forward with the ship going down wind.

The carriers, Yorktown and Enterprise of 20,000 tons, are due to be completed in March, 1937, and July, 1937. It is believed that each of them will carry 79 aircraft.

The carrier of 14,500 tons (C.V.7), authorised under the Vinson Act to replace the Langley, has not yet been laid down, but on the completion of this ship, which it is believed will cost £4,000,000, the total U.S. carrier tonnage will be 135,000 tons, which is the total tonnage allowed by treaty.

Battleships.—All battleships are fitted with one or two catapults, and carry not less than 3 observation type seaplanes.

Cruisers.—The 10,000-ton cruisers developed by the United States are remarkable for their aircraft capacity. They are all fitted with 2 turnable powder catapults, and carry not less than 4 seaplanes. The Augusta carries 6 floatplanes with accommodation for no less than 8.

Submarines.—The submarine S1 is fitted to carry one small aircraft.

Aircraft.—Of the 555 new aircraft authorised under the Naval Appropriations Bill for 1935–36, 282 are for replacements and 273 for expansion. The following changes in aircraft types have occurred during the year :—

SHIP-PLANES.

Fighters.—Curtiss F-11C have gone out of service and Curtiss BF2C–1 (bomber fighter) have come in.

TORPEDO BOMBERS.

Great Lakes TF–1 have gone out of service and Great Lakes TF–2 have come in.

DIVE BOMBERS.

Very great interest is being taken in the provision of suitable aircraft for dive bombing. In this connection the Great Lakes BG–1 has made its appearance as a dive bomber. This aircraft is very strongly constructed, and it is said to be able to carry out dive bombing with a 1,000-lb. bomb.

TRANSPORT.

Atlantic RA–3 have gone out of service. Bellanca RE–3 and Douglas R2D–1 have come in.

FLOATPLANES.

Keystone PK–1 have gone out of service, and Vought O.3U–3 have come in.

AMPHIBIANS.

Loening OL–8 have gone out of service and Grumman JG–1 have come in.

The Vought Corsair single float biplanes, mounted in cruisers, are reported to have a top speed of 160–170 m.p.h. and use tetra ethyl lead in the fuel. They carry two machine guns, one fixed in the starboard upper wing firing clear of the propellor, and one free gun operated by the observer. W/T and D/F equipment is fitted, but not R/T. Short wave is used for normal working and long wave D/F for " homing." The sets are of the " all electric " type, employing a power pack and rectifier, and are claimed to have an effective range of 800 miles.

Plans for a new fleet of flying-patrol boats for the U.S. Navy have been announced by Rear-Admiral E. J. King, Chief of the Navy Bureau of Aeronautics. He stated that 60 aircraft duplicating the XP3Y–1, the experimental Navy aircraft which set up a record by flying non-stop from Colon (Panama) to Alameda (California), a distance of 3,300 miles in thirty-five hours, will be built immediately in San Diego. They will be a nucleus for a great armada of flying cruisers able to carry out non-stop flights up to nearly 4,000 miles and base themselves on the open sea. Actually contracts totalling over $8½ million have been awarded for the purchase of these aircraft and their propelling machinery.

Lighter-than-Air Craft.—The Macon fell into the sea off the coast of California on February 12, 1935, and sank a few minutes afterwards. All but two of her crew of 83 were saved. The U.S. Navy Department is likely to avoid further rigid airship construction, but no definite decision will be reached until the publication of the report of the Durand Committee, which is investigating the problem. This now leaves the U.S. with the metal clad Z–MC–2 of 200,000 cu. ft., which in July, 1935, had two shots fired at her off Point Pleasant, it is believed by rum runners, who thought they were being watched by her. The non-rigid J of 210,000 cu. ft. and the non-rigid K–1 of 320,800 cu. ft. still remain, but are used for training only.

Naval and Air Exercises.

Three squadrons of naval aircraft (24) completed a cruise of 4,000 miles round the Caribbean, and returned to their base at Coco Solo (Canal Zone) on February 16, 1935. During the early stages of the cruise the 24 aircraft flew in company, but on leaving Port of Spain on January 31 they split up and proceeded in independent squadrons, visiting Martinique, St. Vincent, and Guadeloupe, reassembling at San Juan (Puerto Rico) on February 6. On the following day they proceeded to Santo Domingo and remained there till February 10, carrying out manœuvres, culminating in bombing practice at targets towed by minesweepers.

The aircraft tender Wright (Rear-Admiral Johnson) acted as escort and depot ship for the aircraft, and the minesweepers Gannet, Teal, and Lapwing were used as tenders, one to each squadron, during the time the squadrons were acting independently.

Rear-Admiral Johnson expressed himself as pleased with the results of the cruise, saying it demonstrated the Navy's ability to control the entire Caribbean and to aid Puerto Rico and the Virgin Islands.

During May and June, 1935, the largest American Fleet ever assembled under the command of one man, Admiral Reeves, took part in manœuvres. The total number of ships taking part was reported as 153. Included in this number was the Carrier Squadron, consisting of 4 carriers organised as one Division under the command of Vice-Admiral A. V. Butler, one of these carriers being the Ranger. In addition about 60 flying-boats of the Base Force took part under the command of Rear-Admiral Johnson. A total of over 400 aircraft took part in these manœuvres.

JAPAN.

It is understood that the Japanese are proceeding steadily with their programme of expansion, and there seems to be no reason to doubt the conjecture made in the "Annual" for 1935, that by 1938 the Japanese Naval Air Force will comprise, including reserves, about 1,000 aircraft.

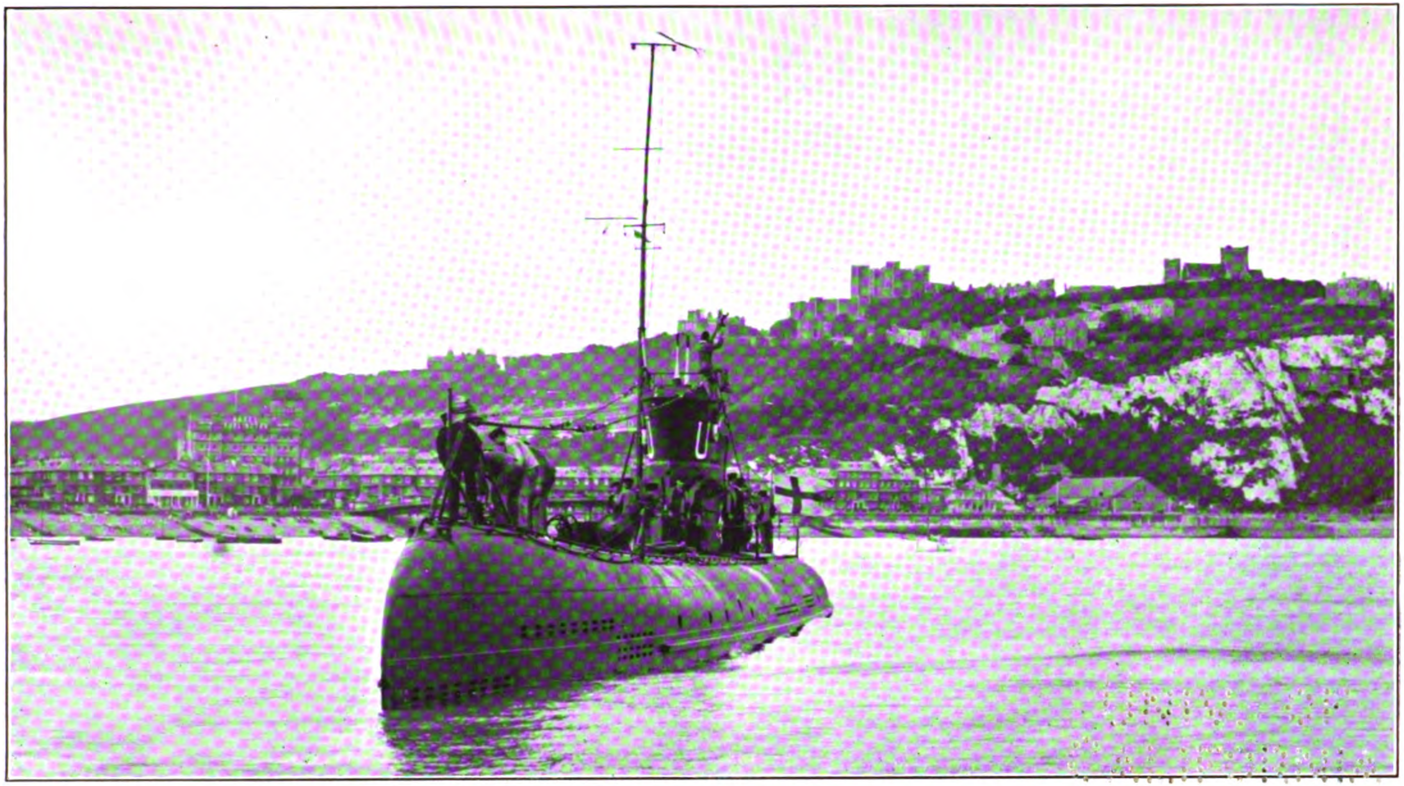
Personnel.—To create a reserve of pilots for the Naval Air Service, the authorities recently decided to give special flying instruction to university college students. As a beginning they instituted a sea section in the Japanese Students' Aviation League. Forty young men were selected from about 160 applicants. The first one-year training period started in July, 1934, and at the conclusion those qualified were commissioned as reserve flying officers in the Navy.

Ships carrying Aircraft.—The following carriers are now in commission: Kaga (60 aircraft), Akagi (50 aircraft), Hosho (26 aircraft), and Ryujo. The Kaga had a big refit in 1934, and it is believed that all carriers are now fitted with arrester gear. The Ryujo, completed in 1933, has recently been under refit, and it seems that she has not been entirely satisfactory, due mainly to poor stability and insufficient headroom in the hangars.

In November, 1934, a new carrier, the Soryu, of 10,000 tons was laid down, and amongst other things the *Nichi Nichi* of November 25, 1934, says of her: "She is designed to match the Ranger which the U.S. Navy boasts of being the world's most formidable aircraft carrier of her size, and has been designed primarily to offset the deficit in Japan's aircraft carrier strength imposed by the discriminating ratio." The Soryu was launched on December 23, 1935.

A 10,000-ton seaplane carrier, the Chitose, was also laid down in 1934. The fitting of aircraft and catapults in battleships, cruisers, and submarine depot ships is still much the same as given in the "Annual" for 1935, but it is believed that the new cruisers building, the Suzuya, Kumano, and Tone, are each to mount 2 catapults and carry 4 aircraft.

Aircraft.—It is understood that the following types of aircraft are now in use in the Naval Air Service:—



[" The Times" Photograph.

THE SWEDISH SUBMARINE UTTERN.

On a Visit to Dover: Town and Castle in the Background.

SHIP-PLANES.

Type 90 (fleet fighters), Type 89 and Type 92 (torpedo bombers and general purpose aircraft).

SEAPLANES.

Type 14 (reconnaissance), Type 15 fitted in battleships and cruisers (reconnaissance), Type 90 (reconnaissance).

FLYING-BOATS.

Type F5 (reconnaissance), Type 90 (reconnaissance), and Type 15 (reconnaissance).

Two type 91 flying-boats made a non-stop flight from Tateyama to Sasebo, a distance of 1,200 miles. The aircraft were in the air for 12 hours and 10 minutes, and maintained an average speed of 100 knots.

Lighter-than-Air Craft.—It is believed that 3 British SS type and 1 Japanese type semi-rigid airships remain in existence, though they are still reported as being in the course of disbandment. However, as it is frequently very difficult to distinguish between service and civil aviation, it is interesting to note that an application has been filed in Tokio to establish a Japanese Zeppelin Company to operate a service between Tokio and Batavia.

Bases.—It is reported that several new naval air bases are being prepared, and it is understood that they are situated as follows :—

1. Yokohama (the aerodrome will be at Tomioka).
2. Kisarazu (Chiba Prefecture).
3. Maixuru (Hoshi Beach).
4. Kanoya (Kagoshima).
5. Chinkai (Straits of Korea).
6. Nemuro (Hokkaido).
7. Kurile Islands.

FRANCE.

The exact responsibilities of the various ministers and military heads of the Defence Services, especially with regard to naval and military aviation, have, during the past few years, been extremely hard to define. However, two things are now quite definite. The first is the constitution of the "Conseil Supérieur de l'Air," and the second is the control of naval aviation.

Conseil Supérieur.—Members with full voting powers : 1. Minister for Air (President). 2. Chief of the General Staff of the Air Force (Vice-President). 3. General Officers of the Air Force, three being Air Force Inspectors and a general officer holding the rank of Commandant of an Air Region. 4. The General Technical Inspection of the Air Force. 5. The Director of Aeronautical Construction.

In addition, the following shall be convened as members of the Council in an advisory capacity without voting powers. 1. Inspector-General of the Air Defence of the territory. 2. Chief of the General Staff and one other member of the Supreme War Council. 3. Chief of the General Staff of the Navy and one other member of the Supreme Naval Council. 4. General Officer Director of Military Services at the Ministry for the Colonies.

When, however, the Supreme Air Council is required to deal with questions affecting either Territorial Air Defence or the Ministries of War, Marine, Air, or Colonies, the General Officers who are members of the Council and represent the Ministry or Ministries, are convened with voting powers.

Control of Naval Aviation.—The "Forces Aeriennes de Mer" are now, by decree under the orders of, or at the disposition of, the Minister of Marine as follows: (*a*) L'Aviation Embarquée; (*b*) L'Aeronautique Maritime de Co-operation Navale Non Embarquée; (*c*) L'Aeronautique Maritime Autonome.

(*a*) only is under the direct authority of the Minister of Marine and comprises squadrons embarked in aircraft carriers (fighter, reconnaissance, and torpedo) and aircraft carried in vessels of the Fleet (reconnaissance and spotting); it is manned by the Navy.

(*b*) is placed permanently at the disposal of the Minister of Marine, who is responsible for its training and tactical employment. It consists of seaplane squadrons for short and long reconnaissance, and also a part of the bomber and torpedo squadrons based on the coast. Manned by the Navy.

(*c*) is controlled by the Minister of Air and allocated to definite missions by the Government. On the understanding that it will not be called upon for other missions, it is placed at the disposal of the Minister of Marine. It comprises fighter, bomber, and torpedo squadrons based on the coast. Manned by the Air Force.

Naval air work is receiving much attention in all its aspects, and large sums of money are being spent in re-equipping various units.

In his speech on the Naval Estimates, Monsieur Pietri (Minister of Marine) stated that the following improvements would be completed during 1935:—

(*a*) All bombing seaplanes of the "Aeronautique Maritime de Co-operation" will have been renewed.

(*b*) Half the reconnaissance squadrons will consist of units equal to any foreign aircraft.

(*c*) The fighters of the Bearn will be capable of 300 km./hr. (162 knots).

It would seem that in spite of a series of most complicated decrees, designed to ensure the smooth running of naval aviation, the co-operation, even now, is not as good as the authorities could wish for. The Minister of Marine has decided, in order to improve the liaison between the Navy and Air Force, that there shall be an increase in the number of appointments of naval officers to courses with the Air Force. This refers especially to those Capitaines de Vaisseaux and Capitaines de Frégates appointed to commands at sea. In addition, officers of these ranks awaiting appointments will do a course with the Air Force in the region in which they are stationed.

Ships carrying Aircraft.—The carrier Bearn, after a refit at Toulon, which was mostly concerned with the installation of new boilers and an increase in the width of the flight deck, joined the 1st Fleet in August.

Battleships.—The battleship Lorraine has now been modernised, and, amongst many other alterations, the centre turret has been removed and the space utilised for the provision of a catapult and the stowage of two aircraft. She will thus be the first French battleship to carry aircraft, though it is understood that the Dunkerque (now building) will carry catapults and 3–4 seaplanes of the " surveillance " type.

Cruisers.—An article in the Press stated that " a new school of thought is becoming manifest with regard to the fighting value of aircraft, both ashore and afloat." It comments upon the gradual strengthening of the seaplane armament in all cruisers, and adds that each of the six new cruisers of 7,000 tons, now building, are to carry four seaplanes of a new type. It is also understood that the new cruisers Jeanne de Vienne and Marseillaise have square sterns to facilitate towing a " landing on " carpet.

Aircraft.—During the year it is believed that Wibault 74 (fighter), and the Levasseur PL14 (torpedo bomber seaplane) have been withdrawn from service, while the Dewotine 372 (fighter), and the Levasseur PL15 (torpedo bomber seaplane) have come into service. Further, it is understood that the Naval Air Service now contains about 200 first-line aircraft.

Bases.—At present, the Naval Air Service has bases at Cherbourg-Chantereyne, Brest Lanion, Berre, Paylvestre, and Bizerta Karuba.

Lighter-than-Air Craft.—It is understood that lighter-than-air craft which are available for naval co-operation are based as follows : At Rochefort there are 2 Escorteur, 2 Vidette airships, and 2 captive balloons, while there are captive balloons at Cherbourg, Brest, Toulon, Cuers-Pierrepeu, and Bizerta.

Exercises.—During the naval exercises of 1935, which were frequently interfered with by extremely bad weather, air co-operation between units of the Naval Air Service and surface craft and submarines was a prominent feature.

ITALY.

It is believed that the modernisation of equipment foreshadowed in the " Annual " for 1935 has been greatly retarded, due to the air authorities being pre-occupied with equipping their land squadrons, particularly those serving in the theatres of war in Africa.

Up to the time of writing, and so far as is known, the Naval Air Service has taken no part in the war, but the Miraglia has been used for transporting aircraft.

In July, 1934, the Italian Government authorised a supplementary air vote of £13,043,478 " for the renewal of Aeronautical Material." No definite period for this expenditure was set at the time, but it is known that £1,379,310 was appropriated for 1934–35.

Ships carrying Aircraft.—The seaplane carrier Miraglia now carries 15 aircraft instead of 9, and they are 12 M18 and 3 Cant 25. The aircraft carried in the 4 battleships and 12 of the cruisers are as given in the " Annual " for 1935, with the following exceptions : Gorizia now carries 2 P6ter instead of 2 MF4. Zara now carries 1 MF4 and 1 Cant 25 instead of 2 Cant 35. Trento (fleet flagship) now carries 2 MF6 instead of 2 P6ter. Bartolomeo Colleoni now carries 2 MF6 instead of 2 M71, and it is believed that submarine Ettore Fieramosca carries one seaplane type P8.

Aircraft.—The types of ship-borne aircraft are mainly Macchi M18 (S.S. fighter flying-boats), Piaggio P6ter (reconnaissance floatplanes), and Cant 25 (S.S. fighter flying-boats). The Cant 35 and the Macchi 71 are obsolete and have gone out of service. The MF6 floatplane has come into service. The Italians have not adopted dive bombing, nor do they favour torpedo attacks from the air, though the S55 (flying-boats) are capable of carrying torpedoes. They favour bomb attacks from high altitudes in large mass formations.

In the early part of the year a British pilot, flying an autogiro of the standard C30 type, succeeded in landing on a platform 33 ft. wide which had been extemporised over the stern of the Italian cruiser Fiume. In the first series of trials the ship was stationary in harbour, and though the velocity of the wind was only 2 m.p.h. the direction was across the ship. The landing was therefore made across the narrow platform. On another occasion the pilot took off and landed with the ship steaming 12, 18, and 24 knots, with complete success, though at each attempt he had to swerve, as he rose to avoid the funnel.

Bases.—There are seaplane bases at the following places : Spezia, Pola, Venice, Vigna de Valle, Naples, Taranto, Brindisi, Orbetello, Elmas. In Sicily : Agusta, Syracuse, and Palermo. In Libya : Tobruk and Tripoli. In Dodecanese : Lepida Bay (Leros) and Rhodes.

Records.—On October 23, 1934, Lieut. Francesco Agello in a Macchi Castoldi–72 racing floatplane (3,000-h.p. A.S.6 engine) at Lake Garda flew at a speed of 440·76 m.p.h.

On July 16–17, 1935, a Cant 2501 (750-h.p. Isotta Fraschini), 4 seater reconnaissance monoplane, light bombing flying-boat, flew from Monfalcone (Trieste) to Berbera (British Somaliland), 3,080 miles. This flying-boat was not specially designed, but was developed by the Regia Aeronautica. Unlike British flying-boats, it is built entirely of wood. On October 19, 1935, an Italian-built, single-engined seaplane, designed by Cant, flew non-stop from Monfalcone to Massawa (Eritrea), 2,576 miles in 26½ hours.

SOVIET RUSSIA.

The view held by the Soviet authorities on the employment of naval aircraft, in the main, coincides with that of "capitalist" countries, though it seems no plan can be so wild that the authorities will not experiment with it. The scope of these experiments is, of course, unknown, but there are rumours to the effect that the possibility of mine laying by aircraft is the subject of much research. This is of interest, if for no other reason than the one that the Russians, since the time of the Russo-Japanese War, have pinned their faith to the mine, and by now are perhaps the greatest exponents of its use.

The organisation by which the Soviet naval aircraft come under the Air Force for administration, and the naval Commanders-in-Chief for operations is still in force. Apart from two or three squadrons of flying-boats and a few seaplanes in the Far East, the two air commands of naval importance are the Baltic and Black Sea. An air brigade consisting of shore-based flying-boat, seaplane, bomber, and fighter squadrons is affiliated to each of these commands, and would undoubtedly take part in any naval operations.

Ships carrying Aircraft.—The seaplane carrier Krasni Moryak (a converted crusier) is now in commission and based on Sevastopol. It is believed she carries about 24 aircraft of fighter and reconnaissance types. There are also three depot ships for seaplanes. The Orlitsa carries 4, the Gidio carries 6, and the Krasnava Strela normally carries 4, but can carry 14 in an emergency.

Battleships.—October Revolution, Mikhail Frunze, Marat, and Paris Commune are each fitted with one catapult and carry two seaplanes.

Cruisers.—Voroshilov, Krasni, Kavkaz, and Avrora are each fitted with one catapult and carry two seaplanes, while the Profintern and Chernonnaya-Ukrainia each carry two seaplanes, and the Komintern (cadets training ship) one seaplane.

Destroyers.—Karl Liebknecht, Uritski, Volodariski, Karl Marx, and Kalinui each carry one catapult and one seaplane.

There are also 7 gunboats, 6 icebreakers, 1 fishery patrol vessel, 1 surveying vessel, and 4 training ships, each of which carries one seaplane, while there are 7 war vessels of unknown types, each of which carries one catapult and one aircraft.

Lighter-than-Air Craft.—It is understood that two new semi-rigid airships, constructed in Moscow under the supervision of the famous General Nobile, are now in commission. One, V6, has a capacity of about 650,000 cu. ft., while the second, V7, is about half the size. An experimental all-metal airship constructed of stainless steel sheets joined by an electric welding process is nearing completion. It is intended to commence the construction of a real all-metal airship about the middle of 1936, provided the experiments now taking place prove satisfactory.

GERMANY.

In April, 1934, the German Government published their Air Budget figures for the last three years.

They were: 1932–33, Reichmarks 43,343,000; 1933–34, Reichmarks 78,348,000; and 1934–35, Reichmarks 210,187,000.

Later, by way of explanation of these enormous and ever-expanding figures, they made a statement to the effect that these sums were required "for the improvement and equipment of German commercial air lines, and for the extension of the passive air defence system."

It was evident, however, that an Air Force was being created, and on March 1, 1935, this was officially brought into being by the German authorities.

Organisation.—The German Air Force, which is a separate arm of the Defence Services under the supreme control of the Minister of Defence, is divided into six commands. Five are geographical areas, while the sixth, with its headquarters at Kiel, comprises all the coastal area stations and aircraft embarked with the Fleet. The officer commanding this area is an Air Force officer, and through it all naval air requirements are met by the Air Ministry. Thus it will be seen that German air requirements are met in a manner similar to our own, with the exception that all pilots and all aircraft are provided by the German Air Force. It is known, however, that German naval opinion favours a separate Naval Air Service.

Ships carrying Aircraft.—It is believed that in the German view aircraft carriers form an indispensable part of a modern fleet, so it is safe to say that an aircraft carrier, or carriers, will be laid down before very long. Naval and air authorities have taken every opportunity of studying our carriers, and they are in close touch with the Japanese, but it is understood that no decision has yet been reached as to whether the 15,000-ton or 25,000-ton carrier best meets their requirements. The German Air Force have, however, 3 aircraft tenders, Christian I, II and III. All cruisers and above will carry a catapult of German design and manufacture and one aircraft. The armoured ships Admiral Scheer, Deutschland, and Graf von Spee, and the cruisers Leipzig, Köln, Karlsruhe, and Königsberg, were each fitted with a catapult during 1935.

Aircraft.—The following types of aircraft are at present in use in Air Area No. VI: Dornier Wal (flying-boat rec.), Heinkel 59 (torpedo bomber), Heinkel 60 (rec.), and Heinkel 51 (fighter).

Lighter-than-Air Craft.—It is not known what use, if any, Germany is going to make of her lighter-than-air experience for naval co-operation, but it is known that selected naval officers do a course in airship navigation.

Naval Auxiliaries.—The S.S. Bremen and Europa are fitted with catapults and aircraft, and it is understood that the equipment of any armed liners intended for operations or trade routes will include naval aircraft.

SPAIN.

At the beginning of 1935 a Press report stated that the centralisation of military and naval aviation, under a single control, was complete. An Air Ministry had been established and a Central Directorate of Aviation, under the direct control of the Cabinet, had been created. The first director under this organisation was Signor Dob Ismael Warleta, who has since been succeeded by General Goded.

More recently the Minister of Marine has been authorised to submit a bill for the approval of Parliament providing for the increased defence of the Balearic Islands, to be spread over five years. It provides for an increase of the Spanish fleet as well as direct defence consisting of land, sea, and air forces co-ordinated under one command, coast batteries, mined areas, and submarine defences. The three sites to be affected by this bill are Mahon and Pollensa, where Naval Air Service bases already exist, and in addition, Palma.

Ships carrying Aircraft.—The cruiser Canarias, completed at Ferrol during 1935, is fitted with one catapult and carries two seaplanes. The cruiser Baleares, due to be completed during 1936, will also mount one catapult and carry two seaplanes. It is understood that the Dedalo, which can carry 25 seaplanes, 2 dirigibles and 2 balloons, is for disposal.

The Spanish Naval Air Service now consists of about 28 aircraft, made up of 5 Martynside (S.S. fighters), 12 Macchi–18 (reconnaissance flying-boats), 5 Savoia–62 (reconnaissance flying-boats), and 6 Dornier Wal (bomber flying-boats), Spanish-built.

In addition there is still one semi-rigid airship in commission with two smaller ones deflated and in store.

PORTUGAL.

An appropriation of £65,000,000 has been approved by the National Assembly for the re-organisation of Portugal's Defence Forces, and the general economic reconstruction of the country. The schemes are part of a 15-year plan, and include, *inter alia*, the re-equipment of the Naval and Military Air Services, and the construction of new military and civil aerodromes.

The Portuguese Naval Air Service is part of the Navy, and comes under the control of the Minister of Marine, Capt.-Lieut. Anibal Mesquita Guinaraes. Under him is the Director of the Naval Air Service, Capt.-Lieut. Pilot Aviator Pedro Ferreira Rosado.

It is understood that 50 per cent. of the present naval aircraft are to be scrapped, and that the Minister of Marine has allotted a sum of about £54,000 for the modernisation of equipment.

Ships carrying Aircraft.—The dispatch vessel Alfonso de Albuquerque carries one seaplane, as will the dispatch vessel Bartolomeu Dias, now building.

Aircraft.—There are, including training, about 22 aircraft in the Naval Air Service, and they are of the following types: C.A.M.S. (reconnaissance seaplane), Junkers K43 (reconnaissance bomber), Fairey IIID (spotter reconnaissance), stationed at Macao, China; and a D.H. Moth seaplane.

It is believed that British engines will be installed in some of the replacement aircraft.

Exercises.—Referring to the manœuvres recently carried out off Madeira, the Press states that their theme was the defence of the Bay of Funchal and the coast against attack. During the first phase the attack was made by submarines and the defence by destroyers and seaplanes. In the second phase the positions were reversed. The report states that further manœuvres will take place in home waters towards the end of August, 1936. Fifteen units and 8 seaplanes are to take part.

HOLLAND.

The Naval and Military Air Services of the Netherlands are separate services, and the policy as given in the "Annual" for 1935 remains unchanged. Broadly speaking, this policy is to train large reserves of pilots and mechanics who can be called on in times of emergency.

The Imperial Naval Air Service is a branch of the Regular Navy, and operates both in home and Colonial waters. Its function is to provide air co-operation units for the Navy and a nucleus coast defence organisation. The part of the Naval Air Service which is retained at home is principally occupied in training personnel for the units stationed abroad and for the General Air Reserve of the Navy.

Ships carrying Aircraft.—There are no ships in home waters which carry aircraft, but in Colonial waters the ships of the Indian Military Marine carry aircraft as follows: Two cruisers each carry 2 seaplanes, 8 destroyers carry 1 seaplane each, 2 minelayers carry 1 seaplane, 1 parent ship for submarines carries 3 seaplanes, and a cruiser, building for the I.M.M., is to be fitted with two catapults, and to carry 2 seaplanes.

Aircraft.—In Holland—for training, 8 Fokker DVII (fighters), 15 Fokker CV (bombers), 10 Fokker C1 (tutors), 18 Fokker CVII (seaplane tutors), and in addition some aircraft type Fokker CVIIIW. In Dutch East Indies for service, 42 Dornier Wal of different types (recco), 12 Fokker T4 (recco), 12 Fokker CVIIW (recco).

It is understood that Captain Frewerda will assume command of the Indian Military Marine, as a Rear-Admiral, early in 1936. He was recently in charge of the Naval Air Station at De Kooy. It is believed that he is opposed to any increase in the Naval Air Service being made at the expense of the Fleet, and that he regards the two services as essentially complementary.

GREECE.

A law has been drafted providing for the formation of a Supreme War Council in Greece. The council is to consist of the chief of the General Staff, the chief of the Naval Staff, three senior officers of the Army, and two each of the Navy and Air Force. The functions of the council will be to study and indicate to the Government measures considered necessary for the country, and to advise as to the distribution of budgetary credits.

No Greek warships are fitted to carry aircraft. The following aircraft compose the naval co-operation units of the Helenic Air Force, and are based on Phaleron and Tatoi:—

4 Hawker Horsleys (reconnaissance bomber landplanes).
4 Armstrong Siddeley Atlas (reconnaissance bomber landplanes).
8 Blackburn Velos (torpedo training seaplanes).
8 Fairey IIIF (spotter reconnaissance seaplanes).

It is understood that 12 Armstrong Siddeley Lynx engines are to be installed in the Avro aircraft now being built in the Blackburn factory at Phaleron.

ROUMANIA.

The Naval Flying Division of the Divisia-I a Aeriana is at present equipped with 12 Savoia S62 bis (reconnaissance flying-boats), and 6 Savoia S55 (twin-hull monoplane reconnaissance bomber). The two aircraft factories in Roumania, the State factory at Brasov and the Set works at Bucharest, are designing and producing new types with a view to replacing foreign types.

TURKEY.

The Turkish Naval Flying Division now consists of 13 reconnaissance bomber flying-boats made up of: 1 Rohrbach, 6 Savoia S16ter, and 6 Southampton Mk. II, all shore-based at Smyrna.

There are no Turkish warships carrying aircraft, and the degree of serviceability of the aircraft is doubtful.

YUGOSLAVIA.

It is believed that the seaplane carrier Zmay no longer carries any seaplanes but is used as a depot ship for seaplane personnel and stores.

The aircraft now in use in the Naval Flying Service are as follows: 6 (all metal) Dornier Wal (bombers), 20 Dornier D.O.D. (torpedo bombers), 1 Smolik S16 (reconnaissance), 32 Icarus flying-boats (reconnaissance), and 1 Fizir floatplane (reconnaissance). Both the latter types are built in Yugoslavia.

SWEDEN.

The Swedish Royal Air Force is an independent force on the same footing as the Army and Navy, and under the Commander-in-Chief, Major-General T. Friis. He is directly responsible to the King.

At the moment a big increase in the Royal Air Force is expected, for a Government Defence Commission set up in 1930 has recommended an increase in strength up to 21 groups, formed into flotillas as follows: 2 medium weight bombing, 2 light weight, 1 fighting, 1 Army reconnaissance, and 1 Navy torpedo and reconnaissance. Each flotilla is to be composed of 3 groups, and it would appear that there are to be 12 aircraft in each group, thus making it a similar unit to our squadron. This would necessitate an increase in aircraft from 100 to 257, to which should be added 80 aircraft of older construction for instructional purposes. It is estimated that it would take about seven years to effect this expansion.

Organisation.—The naval side of service aviation is not separated from the military side, but naval and coastal defence requirements are met by the First, Second, and Fourth Air Regiments, stationed at combined land and seaplane stations as follows: Västerås (First Regiment), Hägernäs (Stockholm) with a detachment at Karlskrona (Second Regiment), and Frösön (Fourth Regiment). In addition there are temporary stations at Boden, Väunäs, Karlsborg, Gustavsvik, Vaxholm, Skillingaryd, Götland, and Gothenburg.

The personnel of the Royal Air Force consists partly of officers seconded for a period of four years from the Army and Navy, and partly of regular R.A.F. officers. There are also a number of reserve officers kept in training. All pilots are given *ab initio* training at the Central Flying School at Ljungbyhed, and in addition there is an Army Co-operation School at Malmen, a Seaplane Flying School at Hägernäs, and a Reserve Officers' Training School at Västerås.

Ships carrying Aircraft.—The hangar cruiser minelayer Gotland is the only ship carrying aircraft. She is fitted with 1 German type catapult and normally carries 6 seaplanes, though she can carry 8 in an emergency.

Aircraft.—The following numbers and types of aircraft are in use for work at sea: 2 Heinkel HE16 (torpedo seaplanes or landplanes), 5 Heinkel HE19 (two-seater fighter seaplanes or landplanes), 15 Heinkel HE5b (spotter reconnaissance seaplanes), 6 Hawker Osprey (fighter reconnaissance floatplanes, ship-borne), and 10 older type Heinkel seaplanes for training.

FINLAND.

The Finnish Air Force is under the administrative control of the Minister of Defence, and under the operational control of the Commander-in-Chief. The officer actually in command of the Air Force is Col. J. F. Lundquist, and under him come the various seaplane squadrons and bases which are an integral part of the Air Force. The pilots of both landplanes and seaplanes are trained at the Central Flying School at Mauhava, the training aircraft being of the following types: Šmolik S218, Sääski II, and Moth. Finland has no war vessels which carry aircraft.

Aircraft.—The following types and numbers of nautical service aircraft are in use: 8 Kotka (Finnish design) (coast defence floatplanes), 26 Blackburn Ripons (torpedo bomber floatplanes), 10 Junkers W34 (long distance reconnaissance floatplanes).

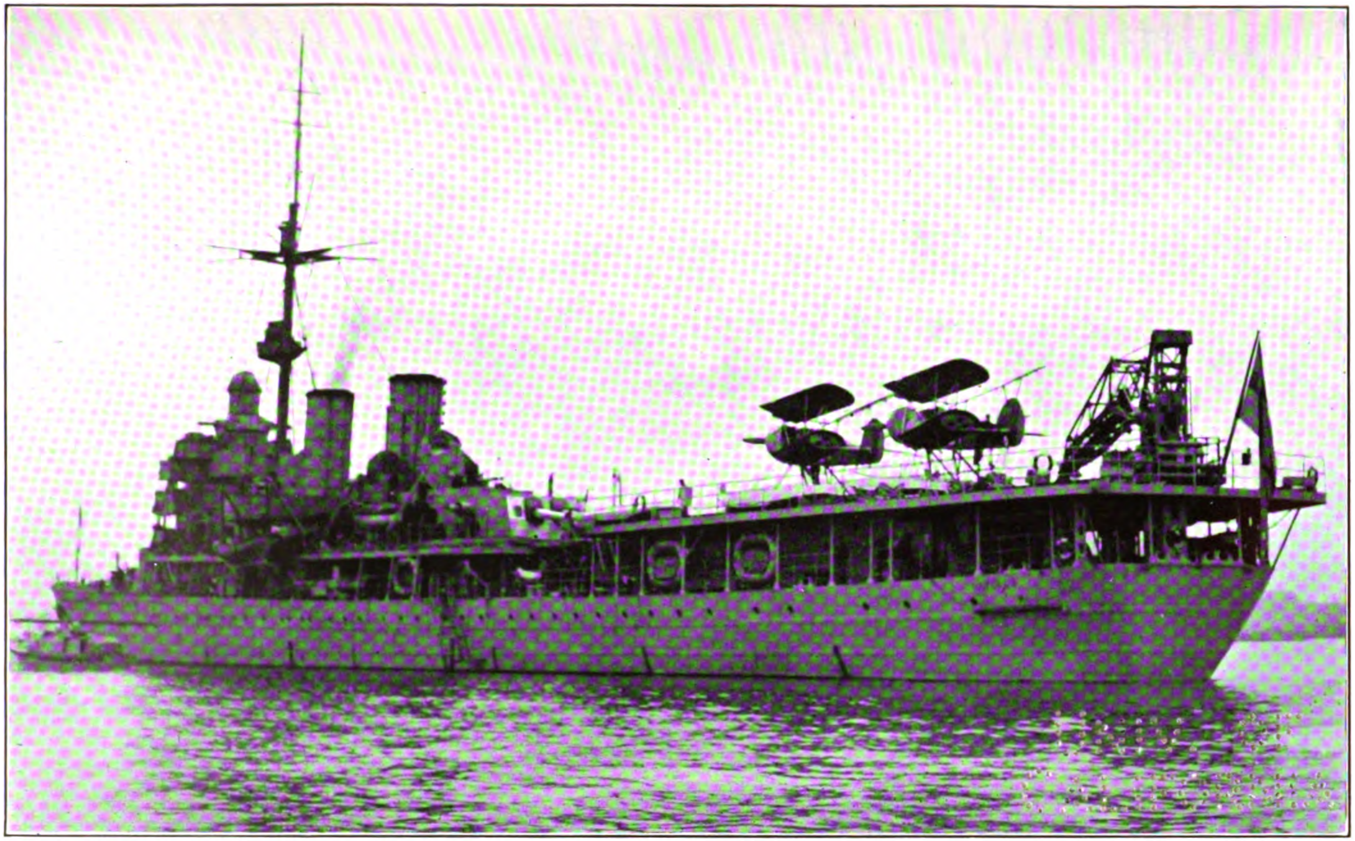
Bases.—There are four main seaplane stations: Santahamina (Helsinki), Vurpuri, Turkinsaari, and Sortavala. These stations are ice-bound in the winter and are then used as land stations.

Although there is no separate naval air service, the air authorities are aware of the importance of close co-operation between the Fleet and the Air Service, and some simple communication exercises have been carried out.

POLAND.

The Naval Air Service, consisting of one division of 4 squadrons, is under the command of Rear-Admiral George Swirski, with its headquarters at Puck. All the aircraft are shore-based, and consist of 16 L.E.O. H3 (reconnaissance flying-boats), 8 Latham H.B.3 (reconnaissance flying-boats), and 3 Schreck H.M.T.2 (training amphibians). All aircraft and engines are of Polish manufacture.

ALBATROSS.



[*Sport and General Press Agency*

THE SWEDISH CRUISER AND SEAPLANE CARRIER GOTLAND.

Displacement, 4,600 *tons* ; *speed*, 27 *knots* ; *armament*, *six* 6-*in guns* ; *accommodation for* 8 *Seaplanes*.

Photographed at Gravesend, February, 1936.

CHAPTER X.

THE MEANING OF AIR STRENGTH TO A FLEET.

AIR operations with the Fleet, as they are understood to-day, are almost entirely the product of post-War experience, which has yet to be subjected to the test of war. Consequently, in any assessment of the influence of air power on fleet operations, it is important that this circumstance should be fully appreciated and that due regard is paid to the effect of enemy opposition, the results of which are difficult to estimate in peace time ; to the removal of peace time restrictions rendered necessary for the safety of the flying personnel ; and to the various other factors whose effect on a new arm can only be rightly judged after experience under actual war conditions. But even after a generous allowance has been made for the effect of all these eventualities, it is abundantly clear that aircraft in the future must exercise a profound influence on the activities of a fleet at sea.

In any examination of the influence of air power on fleet operations, it is necessary at the outset to draw a distinction between those aircraft that are based on shore and those aircraft that are carried in ships. The necessity for this distinction is not always fully appreciated, but it arises from :—

(i) Differences in the types, performance and characteristics of aircraft that are ship-borne as compared with those that are shore-based. The effect of these differences is that aircraft provided for the two purposes are not fully interchangeable one with the other. Thus, shore-based aircraft cannot be operated efficiently from ships, but, on the other hand, ship-borne aircraft, although sometimes of inferior performance, can be operated from shore bases with their usual efficiency.

(ii) Limitations imposed by the differing conditions under which shore-based aircraft and ship-borne aircraft operate. These limitations have important consequences when the strategical effect of the two categories of aircraft are considered. The radius of action of shore-based aircraft is governed by the necessity of returning to a fixed base after each flight in order to re-fuel, re-arm and be maintained. The strategical effect of these aircraft is therefore strictly limited. Ship-borne aircraft, on the other hand, have the advantage that their base, being a ship, confers upon them a mobility which is practically world wide. Consequently, from a strategical point of view, the effect of ship-borne aircraft can be infinitely larger than that of shore-based aircraft.

(iii) Differences in the training of the flying personnel of shore-based and ship-borne aircraft. The effect of these differences is mainly tactical, since the personnel of shore-based aircraft usually lack the specialised knowledge and training which is essential for their efficient operation with or against naval forces.

This brief summary of the more important differences between shore-based and ship-borne aircraft serves to illustrate the necessity for drawing a distinction between these two categories of aircraft before any attempt is made to examine in more detail the influence that aircraft in general can exert on the operations of a fleet at sea.

Of the two categories into which aircraft have now been divided, the effect of those that are shore-based, although probably of the lesser importance, has in recent times received the more publicity, while at the same time being the subject of much ill-informed remark. On the one hand, there is a large body of opinion which holds that the days of the Navy are over, and which, misinterpreting the results of a few inter-Service training exercises, concludes that shore-based aircraft have driven the Fleet completely from the seas. On the other hand, there are those who, with a truer appreciation of the actual conditions and results of these exercises, but probably unduly biased by the opinions of the first body, have tended to disregard completely the potentialities of shore-based aircraft, as far as fleet operations are concerned. Both views are, of course, extreme, and the truth lies somewhere in between. There are many fleet operations upon which shore-based aircraft could exert no influence at all, simply owing to their inability to reach the scene of operations, or even if this is possible, to arrive there in sufficient time to be of any value. There are other operations in which their influence might be inconsiderable through their personnel lacking the opportunities for obtaining experience and training in naval air work and being deceived by obvious *ruses de guerre*, attacking the wrong target, or placing themselves in a position to be destroyed—occurrences which are only to be expected if the personnel of shore-based aircraft are inexperienced, as is probable, in naval aviation. Finally, it must be appreciated that, as a general rule, shore-based aircraft do not possess the specialised equipment which is essential if operations are to be undertaken over the sea.

But, balanced against the disabilities under which they normally operate over the sea, shore-based aircraft usually have decided advantages in their superior performance and their capacity to carry bigger war loads. Consequently, provided their personnel know their job, he would be a rash naval commander who would venture any but his most heavily protected or fastest ships into the close proximity of large concentrations of these aircraft. Also it is probably possible ultimately to bring larger concentrations of aircraft to any desired spot by land than it is by sea, a factor which becomes of some importance when fleet operations are considered in connection with prolonged combined naval and military undertakings.

Up to this point, the influence of shore-based aircraft on fleet operations has been regarded mainly from the aspect of their operation against, and not with, the Fleet. In the latter case the disabilities already referred to are probably magnified, for not only is it apparent that the standard of training must be higher if co-operation with naval forces is to be effective, but it must also be possible for the Fleet to place absolute reliance on the shore-based aircraft being available on the scene of action, with a complete grasp of the current situation and of the action that is expected of them, at the exact moment that they are required.

It may be said at once that it is very improbable that shore-based aircraft can satisfy these two conditions, and it is no doubt a realisation of these facts that manifests itself in the appearance to-day of ship-borne aircraft in the navies of the world. At the same time, it must not be imagined that shore-based aircraft can never be of any value to a fleet. Such is far from being the case. Provided their personnel is suitably trained, and provided that adequate means exist for moving the extensive ground equipment and the various stores essential for their efficient operation, shore-based aircraft can be most usefully and most suitably employed in narrow waters ; also in the many duties connected with the local defences of fleet bases and for the various distant patrols required when a fleet is in harbour, and it is desirable to conserve its ship-borne aircraft for the battle.

It will be seen, therefore, that the influence of shore-based aircraft on fleet operations is often extremely limited in the spheres both of strategy and of tactics. *Strategically,* to a degree which will vary considerably, depending on the exact nature and location of the naval operation in question and which, in certain circumstances, may be practically negligible while in others, where the operations would be in the close vicinity of large concentrations of aircraft, their influence may be considerable ; and *tactically,* to a degree which depends almost entirely on the extent of the training and equipment of these aircraft for naval air work, for which only a small percentage of them normally possess the necessary specialised qualifications.

On the other hand, the influence of ship-borne aircraft on fleet operations is probably not circumscribed to the same extent. Of course, there should never be any question of these aircraft failing to arrive on the scene of action when required by the Fleet, nor of them lacking the equipment and training essential for undertaking naval air operations. Consequently, it is these aircraft—the aircraft that in this country constitute the Fleet Air Arm—whose influence on fleet operations will probably be the greatest. Of the various duties undertaken by these aircraft, those which concern the Fleet most vitally are air reconnaissance, air striking and air spotting, and their importance is such that a detailed description of each of them is not out of place.

Air reconnaissance is the comprehensive term used to describe that wide field of aircraft operations which are undertaken with the object of obtaining information about the enemy. These operations will probably begin during the period when the opposing fleets are widely separated but approaching each other, and culminate during the period that the fleets are in actual contact, that is, during the battle phase.

Before the advent of aircraft, reconnaissance during the period when the opposing fleets were searching for each other was the responsibility of men-of-war of the cruiser type. These vessels were spread out as a screen ahead of and across the line of advance of the Fleet, their distance from the Fleet, and therefore a measure of the amount of warning that they would give, being governed by the necessity of ensuring that these vessels could be supported by other units of the fleet should superior forces be encountered. Once this screen had obtained contact with the enemy, it was almost certain that an action of some sort would develop due to the fact that the ranges of naval guns were by that time in excess of first sighting ranges.

The employment of aircraft in reconnaissance has, however, considerably modified this conception of the initial search operations for the location of the enemy fleet. Due, not to their range of visibility from the air, which is no better than that obtained at sea level, but to their high speed and their ability to search quickly large expanses of ocean, aircraft have extended this reconnaissance screen to a distance which is now governed solely by the radius of action of the aircraft themselves and not, as heretofore in the case of cruisers, by limitations imposed by considerations of mutual support.

In consequence, first contact between the opposing fleets will now no longer be the rather chance encounter of bygone days, taking place at distances of approximately twenty miles, but the deliberate result of extensive air reconnaissance operations which may have taken place at distances of over 200 miles from the fleet. Contact with an enemy fleet may be established in this manner many hours or even days before the surface forces get into touch, and during that time the enemy forces might be kept under continual and close observation by aircraft, which, taking advantage of the cover provided by cloud formations, may never even be sighted by the enemy fleet in question. The ability of reconnaissance aircraft to locate and maintain touch with an enemy in this way has had several far-reaching consequences, but it is only necessary at this stage to draw attention to one of them, although possibly it is the most important one.

Generally speaking, the most difficult problem in naval tactics is that of bringing an unwilling enemy fleet to action, unless it so happens that he is either in, or can be forced into, an unsound strategical position from which he cannot escape except by battle. But in these days the problem is rendered even more difficult because a fleet that may not wish to accept the hazards of battle may obtain, by means of extended air reconnaissance, such early information as may not only enable it to avoid action with surface forces completely, but may even allow it to extricate itself from an unsound strategical position.

But let it be assumed for one moment either that the two opposing fleets are willing to fight, or that the strategical position of one of them, the enemy fleet for example, renders an action inevitable. Then during the time the enemy fleet is approaching it is now possible for it to be kept under continual observation by reconnaissance aircraft and its position, course and speed to be frequently reported, together with any change that may be made in the disposition of its various units. It need not necessarily be imagined that these observation duties cease when once the opposing fleets open fire. On the contrary, when this phase is reached, air reconnaissance operations may become, if anything, more intensive than before, and it is possible for all the important units of the enemy, their battleships, aircraft carriers, submarines, destroyers and so on, to be kept under observation and all their movements reported by aircraft specially detailed for this purpose In conditions such as these aircraft would be well placed to clear up any points about which the Commander-in-Chief, due to those conditions which are sometimes referred to as the fog of battle, may be in doubt. Therefore, in actions of the future, there should never be that "uncertainty as to the position of the enemy battlefleet" * which was in the British Commander-in-Chief's mind at Jutland, and which resulted in a signal demanding the whereabouts of the enemy battlefleet only some twenty minutes † before the gun action between the two battlefleets was begun. In these days of air reconnaissance such uncertainty is unthinkable.

Air reconnaissance having located the enemy fleet, the stage is now set for the next act to begin, and it is not improbable that this will be concerned with the air bombardment of the enemy fleet by the aircraft of the striking force. The weapons which it is possible for these aircraft to use are two, the torpedo for attacking the under-water and most vulnerable portions of a ship ; and the bomb for attacking the above-water, and most heavily protected portion. Which of the two weapons is employed must depend, of course, on the situation existing at the time and on the type of target that is likely to be attacked.

The tactics of the air striking force must obviously vary considerably depending on which of the two weapons is being employed. When armed with the torpedo a typical attack might take the following course. The aircraft, after leaving their parent ship, would climb to a height which in conjunction with any cover that may be provided by clouds, will render them least likely to be detected during their passage towards their objective. Once their objective is sighted and, if possible, before they themselves are seen, the aircraft would be manœuvred into a position whence, under the existing conditions of light and cloud, there is a likelihood of their attack coming as a surprise. From this position, the aircraft would dive rapidly towards their objective and when they have approached to within a few hundred yards and were close to the water their torpedoes would be released at the target. Then wheeling rapidly and gaining height, they would make their escape as quickly as possible.

The aircraft torpedo attack has, however, certain disadvantages. Just prior to the release of the torpedo, the aircraft are committed, for a few moments, to a steady course and in consequence their freedom of manœuvre for avoiding the gunfire of close range anti-aircraft weapons of a modern fleet is very limited. Further, a well executed attack calls for a high degree of skill and considerable training on the part of the personnel taking part, thereby making their replacement extremely difficult in the event of casualties ; also the attacks of all aircraft must be synchronised in order that

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* Jutland Despatches, p. 16.
† Jutland Despatches, App. II, p. 457.

any avoiding action which the target may take, such as large and frequent alterations of course and speed, may be rendered ineffectual. But despite these limitations, a well executed attack pressed strongly home, under conditions in which the element of surprise has not been forfeited, constitutes a threat which capital ships cannot regard with equanimity, although to lighter ships of the cruiser class and below, with their ability to manœuvre rapidly and thus avoid the attack, the threat may not be so serious.

When armed with the bomb, the striking force's method of attack differs with the actual type of bombing that is to be employed, but for our purpose it is only necessary to consider two types of attack—level bombing and dive bombing. Whichever of the two is employed, it is important to appreciate that they are both subject to an important limitation in as far as their attack on men-of-war is concerned. These ships are invariably protected with armour which must be penetrated if vital damage is to be effected. For this purpose it must be realised that the bomb is at a disadvantage compared to the shell. Whereas the latter can be given a velocity which will enable it to penetrate armour, the bomb, on the other hand, is mainly dependent on gravity for its velocity, and, in consequence, its penetrative effect is determined by the height at which it is released. Thus, to penetrate a given thickness of armour, a bomb of any given weight has to be dropped above a certain definite height. Consequently, bombing attacks on men-of-war must take place at heights of many thousands of feet if the bomb is to be given a chance of penetrating their deck armour. At this height, the only practical method of bombing is by means of level bombing. In this form of attack, once the objective has been sighted, the aircraft must maintain a steady height and speed until the bomb sight indicates that the bomb-dropping position has been reached, after which the aircraft has complete freedom of manœuvre for making its escape.

In actual fact, this method of attack is by no means the simple undertaking that it might appear from the foregoing description. Although the target may be approached from any direction, the determination of the actual position and time at which the bomb should be released in order to obtain a hit depends on several factors which include the course and speed of the target and the speed and direction of the wind. These factors have either to be calculated from observation or estimated by eye and any errors in them must result in serious inaccuracies in bombing. It is therefore not surprising that the percentage of hits obtainable even when using sights is comparatively small and it is not unlikely that this percentage will become even smaller if the attack is observed and the target is therefore able to take avoiding action by alterations of course and speed. There is also another consideration which must not be overlooked. For a short period before releasing the bomb, the aircraft are committed to maintaining a steady course as well as the steady height and speed already referred to. Consequently, during this period they present a good target to the long-range anti-aircraft guns of which all modern fleets now possess a formidable concentration. Under such conditions, level bombing attacks on the battlefleet, although providing the only means of obtaining penetration, may ultimately only prove a profitable operation when the attention of the enemy is diverted by attacks from other directions.

The alternative method of dive bombing is not, however, open to similar objections. In this form of attack, the aircraft dive straight towards their target at a very steep angle, their final approach having been made in a manner similar to that employed by the torpedo aircraft. When within some thousand feet of the target they release their bombs, and then, pulling swiftly out of their dive, the aircraft either proceed to make their escape or obtain a position whence a second attack can be made. Although in this attack the aircraft may possibly approach within the effective fire of the extensive short-range anti-aircraft armament of a modern fleet, the period under actual fire is probably very short and the target presented is not likely to be an easy one, particularly if the attackers have achieved surprise. Of the two methods of attack, this is believed to be the more accurate.

Effective avoiding action on the part of the target must be extremely difficult, due to the speed and short duration of the attack. Accuracy in bombing has, however, obviously been obtained at the expense of penetration. Consequently, this method may be really adequately employed only against lightly armoured ships, or under conditions when its penetrative limitation must be accepted owing to weather conditions or cloud formations precluding bombing at the heights necessary to obtain the penetration of the armour of the capital ships.

Thus, in summing up the effect in naval operations of aircraft of the striking force, it may be said that, within certain limits, the torpedo and the gun, which previous to the advent of aircraft had ranges of about ten miles, are now given ranges which are limited only by the radius of action of the aircraft themselves.

There is one important factor to which it is desirable to draw attention at this stage. This factor, that of numbers, has particular significance in naval air operations in general, but its influence becomes more readily apparent when it is considered in relation to that aspect of naval air operations just examined—that of the air striking force. In the attacks of this force, an increase in the number of attacking aircraft, provided of course that they are suitably trained and equipped, carries with it a more than proportionate increase in the effect that is likely to be achieved. This can probably best be illustrated by the following example. Four bomber squadrons together attack a squadron of ships whose combined anti-aircraft armament is just capable of engaging this number of aircraft at any one time; obviously, in this case there is every possibility that the attackers will fail to score any hits at all. But now, supposing a fifth squadron joins in the same attack, then it is quite conceivable that their particular efforts will be unopposed by the ships, and that several hits may result. The principle is plain —aircraft must never be employed in penny numbers; it is the surest way of dissipating air strength without achieving profitable results.

As a consequence of the limitations in the striking capabilities of aircraft as far as men-of-war are concerned, the main responsibility for ensuring the destruction of the enemy's main forces must rest, as heretofore, with the gun armament of the capital ships. At the same time, any means by which aircraft may increase the effectiveness of this armament must be fully exploited. Such a means exists in the employment of aircraft for spotting the fall of shot and providing the other data without which the gun armament of a fleet will not develop its maximum efficiency.

The advantages of aircraft spotting are many. It is only by their aid that gun-fire can be opened on an enemy which, although out of sight due to distance, smoke or weather conditions, is yet within the effective range of the guns. Conditions such as these frequently occur in actions at sea, and a fleet which is fully able to develop its fire in these circumstances must obviously attain a great tactical advantage. Again, there are many occasions when the enemy is sufficiently visible for the guns of a fleet to be laid, but when the fall of shot cannot be observed from the firing ship. Occasions such as these were of frequent occurrence at the Battle of Jutland. The ability to develop the gunfire of a fleet under such conditions has considerable tactical possibilities, for it may be possible to place an enemy fleet, one, for example, which may not have developed air spotting, in a position in which, due either to artificial or to natural effects, such as smoke or haze, there is bad visibility ; then when the enemy is in this position, to develop one's own gunfire against him to an overwhelming extent by means of air spotting.

The value of air spotting need not necessarily be confined, however, only to the occasions when visibility conditions are difficult. In good visibility aircraft, although perhaps of less value, can always be usefully employed in clearing up doubtful points which must frequently arise in the fire control officer's mind during an action at sea. Also, it must not be imagined that air spotting is the sole prerogative of the capital ship. It is also of value to the cruiser particularly on the occasions, frequent in cruiser actions, when an " end on " target is engaged. The narrow target presented on these occasions makes it extremely difficult for the firing ship to spot for range when the salvos fall slightly out of line. To the aircraft, however, this presents no difficulty, and in consequence, with air spotting, hitting can be established more quickly and with less expenditure of ammunition. In general, it may be said without fear of exaggeration that unless aircraft spotting is provided, the gun armament of a fleet cannot but fail to develop its maximum efficiency. Air spotting, at one time regarded as somewhat of a luxury, has now become a vital necessity.

The large numbers of aircraft which are required to undertake the duties outlined above raises problems in connection with their accommodation and operation in the fleet. These problems are further complicated by the following factors :—

(*a*) The need for their collective training, organisation, and operation, if the aircraft engaged in fleet reconnaissance and striking are to develop their maximum efficiency, and

(*b*) The need for providing a landing platform at sea if aircraft are to operate in weather conditions other than the calmest, or if they are to be regarded as capable of anything more than one flight.

In the meeting of these two requirements, a new type of man-of-war has been evolved—the aircraft carrier—which in itself provides a take off and landing ground for the aircraft together with the accommodation, store, repair and other facilities without which aircraft cannot be operated efficiently. This organisation does not, however, meet the requirements of the spotting aircraft. The efficient performance of their duties calls for a high degree of co-operation between the ship's gunnery personnel and the personnel of the aircraft, co-operation which can best be obtained if the latter and their aircraft are carried in the ship for which they spot. For launching the aircraft into the air a catapult is provided, but once in the air, the aircraft on conclusion of its flight has practically no alternative but to land on the sea. There is, however, a possibility that a landing may be effected on a carrier, but this cannot be relied upon, for it would generally be impossible for aircraft carriers to compete with these additional spotting aircraft without disorganising their own flying operations. This limitation on the spotting aircraft is, however, acceptable since the co-operation of the fire control and aircraft personnel, coupled with the fact that the spotting aircraft are almost instantly available, is held to be of the greater importance.

At this stage it might well be asked why aircraft of the seaplane or flying-boat type are not employed in meeting the air requirements of a fleet at sea. Surely it would simplify matters if the aircraft on the conclusion of their flight landed on the sea and were then hoisted in by their parent ships! At first sight this seems to be an attractive proposition, but in practice it has certain disadvantages which include the following :—

(i) To land safely on the sea an aircraft must possess the qualification of seaworthiness. The attainment of this quality, even to a limited degree, necessitates the sacrifice of other qualities, as for example, performance, which are essential characteristics of aircraft employed in fleet work.

(ii) In the weather conditions normally met with when a fleet is at sea, it is extremely unlikely that aircraft of the flying-boat or seaplane type could land on the sea and be recovered by their parent ships, without being seriously damaged.

(iii) Even if the weather conditions did permit of these aircraft landing on the sea, it is highly improbable that the parent ships, owing to tactical considerations, could stop and recover their aircraft.

For these reasons, therefore, the seaplane or flying-boat type of aircraft does not readily find a place in the air operations of a fleet at sea.

This statement must, however, be qualified when considered in relation to certain naval operations, such as, for example, trade protection. These operations, which are really outside the scope of this article, are normally undertaken by men-of-war of the cruiser type, and differ considerably from fleet operations ; it may well be that in these particular conditions aircraft with the characteristics of a seaplane or flying boat would prove of considerable value.

There is one important consideration which now calls for some remark. This is the question of air security, or air superiority as it is sometimes called. It is easy to see that success in the various duties undertaken by aircraft in fleet operations must depend to a great extent on the security of these aircraft and of their base, particularly when the latter is an aircraft carrier. Should the latter be destroyed, the majority of fleet air operations must automatically cease as soon as the endurance of the aircraft in the air has been expended.

With the object of giving the fleet a measure of air security, the fighter type of aircraft is provided, a proportion of them being accommodated in the aircraft carriers and a proportion in the catapult ships. These aircraft are operated with the dual object of furthering our own air operations while, at the same time, denying to the enemy the use of his own aircraft. Complete reliance for air security cannot, however, be placed on fighter aircraft, for it is a notoriously difficult operation to seek out and destroy enemy aircraft once they are in the air. To obtain air security by the use of fighters would require a phenomenal number of aircraft far beyond the accommodation capacity of the Fleet. In any case, it would mean locking up aircraft solely for defensive purposes, a highly undesirable proceeding. Probably the best solution of the problem of achieving air security, and one which has repeatedly been advanced in Service publications both at home and abroad, lies in an early and vigorous search for the enemy's aircraft carriers, followed, as soon as they are found, by an immediate offensive by the striking force, the attack being delivered, if possible, before the enemy's striking force has flown off.

The foregoing brief description of the rôle which suitably trained and equipped aircraft can play in the operations prior to and during a naval action clearly indicates that a fleet deficient in aircraft cannot be regarded as an efficient fighting force. It is not an exaggeration to say that without aircraft a fleet can never attain the position visualised in Bacon's famous aphorism "He that commands the sea is at great liberty and may take as much or as little of the war as he will." In fact, without suitable aircraft, a fleet is practically blinded, and unless it seeks the shelter of its harbours, it is only a matter of time before it is lured into an unsound strategical position and compelled to fight under the worst possible conditions.

ZETES.

CHAPTER XI.

Air Operations on Trade Routes.

I. The Terminal Point of the Trade Routes.

At the outset of this article it is desired to emphasise that, at the present time, the most perilous period in the transport of goods into this, or any other, country, is probably from the arrival of a large number of ships at one destination, during the unloading of their goods, and until these goods have been transported away from the port. In many ways the principles of naval strategy and tactics have not been greatly altered by the advent of aircraft, but in this respect a great alteration has occurred.

Formerly, ships were safe when they arrived in port because enemy raiders could be prevented from reaching them. It is, however, impossible to stop aircraft getting where they want to, and consequently, if the port is within air radius of enemy bases, it may become the most dangerous instead of the safest place on the trade routes. The scale and effect of this form of attack on trade will depend chiefly on the number of hostile aircraft available to attack the port and on the distance they must come to reach it. Having indicated this danger point, it is not proposed to enlarge on a question which comes into the same category as air raids on towns and industrial areas, and not within the scope of this article.

II. The Capability of Aircraft to Search for Ships at Sea.

There are certain misconceptions regarding air reconnaissance. Many people think that searching aircraft gain an advantage over searching ships by reason of their height, and that they can see farther. This is true to the extent that from an aeroplane mountains and coasts can be seen at enormous distances in clear weather, but it is wrong to say that height gives an aeroplane any advantage in sighting ships ; indeed, it is a disadvantage.

From the bridge of a cruiser the first indication of another ship is a break in the horizon line which may turn out to be smoke or the masts and funnels of a ship, hull down. From the cockpit of an aeroplane, however, there is no silhouette ; on the contrary, the ship is against a background of sea, there is no steady platform to observe from, and high-powered glasses are difficult to use in the slipstream.

The great advantages which aircraft have over cruisers in reconnaissance are, therefore, that they go very fast and cover a wide area, and that they are cheap. Also an aeroplane sighting a ship may be able to avoid being sighted by her ; it will be appreciated that this is an important point in the case of enemy raiders who may normally be expected to be at slow speed, economising fuel; but who, if they knew they were under observation, would at once increase to high speed and make for safety.

Finally, the forms of aircraft search must be considered. This is an extraordinarily complex problem involving a high standard of mathematical knowledge and also a good fund of common sense. So much has been said and thought and written on aircraft search that not even a summary can be given in this article.

Assuming that all warships carry aircraft, it is the opinion of the writer that the principles of air search favour the pursuer rather than the pursued. The latter must avoid being brought to action and to this end he must send out his aircraft to make certain that no enemy ships are near; he cannot leave gaps in his patrol. On the other hand, the pursuer can, so to speak, join in the search himself; he can send his aircraft out on wide searches and need not consider security, for if he suddenly sights the raider, even though aircraft had not reported it—so much the better, it is what he wanted to do.

USE OF FLYING BOATS.

Ship-borne aircraft can never become large, but flying boats may; and it is true to say that in the near future we shall see flying boats capable of high endurance and able to cover large tracts of sea. Again, flying boats, distributed among the many bases which we possess on the ocean routes, could operate in most weathers. But they have certain disadvantages. They are so big that they have little hope of sighting or shadowing a ship without her knowing it. They are large targets and rather cumbersome in manœuvre, and, although they can carry a large weight of armament, they are not efficient weapons of attack. The third disadvantage is that the ships with which they must work cannot rely on the accuracy of their reports; all aircraft positions are liable to error, which, of course, increases in proportion to the time they have been in the air; the positions of ships are also frequently in error. If one can imagine present aircraft equipment at the Battle of Jutland—that is to say, supposing the Grand Fleet had had carriers and that there were also flying boats operating from Felixstowe—there is no doubt that the Fleet's own aircraft reports would have been of far greater value than the flying boats' reports.

It may be said that flying boats, covering as they can a wide area, may be relied upon to find enemy ships in the areas which they can cover, and to report their approximate positions. Ships chasing cannot rely on these positions to make contact, and there comes a time when they are no longer interested in the geographical positions of themselves or the enemy; what they want is his relative bearing, and only their own aircraft can give it to them.

Radius of Action.

Before leaving the subject of aircraft search on the ocean routes, it is desired to refer to two fallacies which were at one time prevalent but which, it is hoped, are now exploded. Someone with little practical experience is inclined to work out the radius of action of his aircraft, to take his dividers and to describe a circle of this radius with his base as centre, and then to assume that a ship passing within its circumference is as good as caught.

Actually, of course, a wind from any direction reduces the radius of action of aircraft. The writer has often been asked why an aircraft flying to and fro along the direction of the wind should not benefit as much from the following wind as it loses against it ; the answer of course is that the aircraft is flying against the wind longer than it is flying with it.

Secondly, our circle assumes that aircraft are constantly on its circumference, not more than twice visibility distance apart ; whereas in reality they are there only for a moment and may well pass their reliefs when they are only halfway out.

Some emphasis has been laid on the various disadvantages of aircraft and searching units and further disadvantages will be referred to later which apply to both searching and attacking aircraft. It is, however, far from the intention of the writer to suggest that aircraft are unsuitable for the purpose of searching ; on the contrary, in his opinion they form far the most efficient and economical solution of a problem which has much troubled our Navy throughout its history.

III. The Capability of Aircraft to Attack.

It is true to say that air reconnaissance is much the same in peace as in war, and that we know just how much to expect from it when hostilities break out. The power of the aircraft to attack is, however, extraordinarily difficult to estimate ; in spite of wireless-controlled aircraft as gun targets and wireless-controlled ships as bomb and torpedo targets, it is impossible to eliminate the " set piece " atmosphere, or to have any test at all of the effect of morale.

In the very tentative opinion of the writer, air attacks on a well-armed and well-armoured cruiser would result somewhat as follows :—

A high bombing attack would be a bloodless affair ; the aircraft would drop their bombs and miss the ship, and the ship would fire her guns and miss the aircraft.

A diving bombing attack would result in severe damage to the ship's upper works, but there would be little chance of sinking her, and not much even of reducing her speed. The aircraft might well escape unscathed.

The effect of a torpedo attack is very problematical. The view is held that many aircraft would be shot down, but that if this did not impair morale, some torpedoes would hit, that the ship might be sunk, and that in any case her speed would be reduced and under-water damage sustained which would necessitate docking and months of time to repair. (It should be noted that these views apply to attack against a single ship and not against a fleet.)

The case of merchant ships is very different; it appears that these vessels are almost completely at the mercy of attacking aircraft. Anti-aircraft gun fire is a matter of such extreme difficulty that only a formidable armament combined with continuous training and exercise can hope to achieve success. Add to this the weak construction of the ships, and the odds against them seem enormous. Nor does convoy appear to afford a solution and it may be a positive disadvantage. In spite of defensive air patrols, look-out ships, and ships with efficient A.A. armament in company, it is not believed that a convoy could be properly defended. Even a fleet, with its tremendous volume of fire, and its armour plate, would have its work cut out to defend itself.

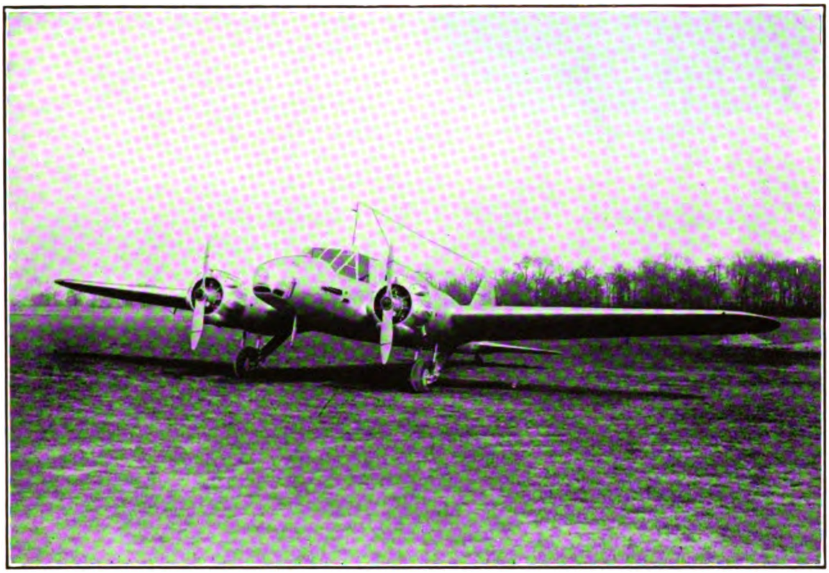
The view is put forward that ships in convoy are easy to find and conveniently grouped from the point of view of the attackers. The defence which can be provided does so little to counter these disadvantages that, against air attack, it is much better for ships to rely on evasion and be separated. If this is agreed to, then the institution of a convoy system would have to be decided according as submarines or aircraft formed the greater menace.

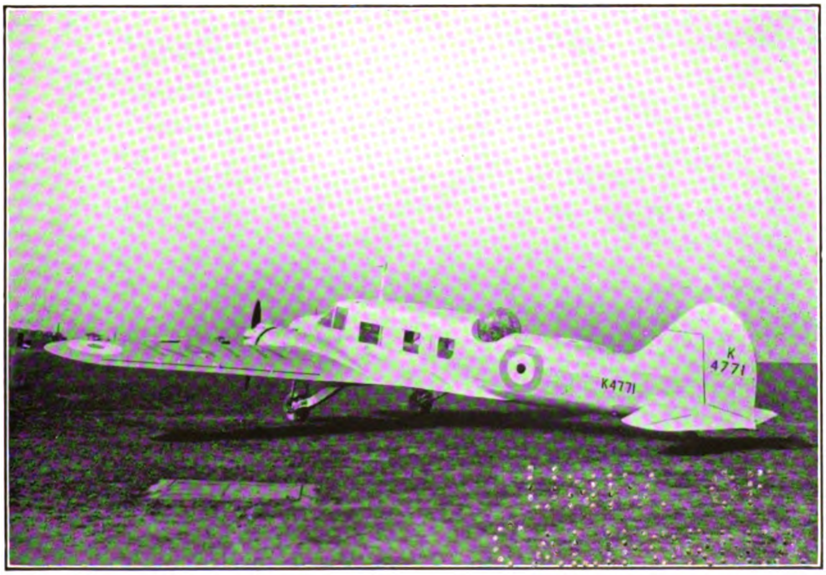
IV. Capability of Aircraft to Defend Ships against Submarine Attack.

Peace exercises are unreal in so far as ships are committed to pass through a submarine-infested area which in practice they would try to avoid. It is far more important for a convoy to be informed of the presence of submarines lying miles ahead in its path, whose attack can be avoided by altering course, than to hear of them when they are within range, with their torpedoes perhaps already approaching.

Submarines without exact knowledge of the position and movements of ships would like to be on the surface on the line of expected approach, to dive as soon as the masts and funnels of the convoy have given the required information, and then to manœuvre submerged or at periscope depth. It is during the period on the surface that they are most inconvenienced by aircraft, which can either force them to keep down or find and report them if they come up.

Aircraft patrols close to the convoy can, of course, be established and usually are, but submerged submarines are very difficult to see from aircraft. It is true that in clear calm waters such as those sometimes found in the Mediterranean, submerged submarines can often be seen clearly; in fact they have been seen down to 90 feet. In home waters, however, submerged submarines are almost impossible to sight from the air, whilst those at periscope depth are sighted more by luck than anything else. What actually happens in peace exercises is that the extended patrols sight a submarine, and that the air patrol close to the convoy, knowing that there is one near him, pays special attention and perhaps sights and reports it, and also possibly the torpedo which it has just fired. The view is put forward that this is unrealistic and spectacular, that the submarine would probably not have been sighted except for the reports of the outer





TWO VIEWS OF THE AVRO ANSON TWIN-ENGINED MONOPLANE.

Adopted for Coastal and General Reconnaissance, 1935.

Siddeley Cheetah Engines.

patrols, and that if such a report had been received, the convoy would have altered course so as to make an attack impossible.

Turning now to the question of air attacks on submarines, one is faced with the same uncertainty as in the case of attack on any other type of ship. One can only express an opinion, which is that aircraft are unlikely to make successful attacks on submarines. Their weight of bombs would be better allotted to petrol or to another look-out. There should, however, be close co-operation between aircraft and escorting destroyers which can carry heavy explosives and can distribute them in the most effective way.

V. Other Limitations applicable primarily to Ship-borne Aircraft Employed on any Duty.

The chief limitations under this heading are due to air navigation and weather; neither of these affects flying boats nearly so much as ship-borne aircraft.

A flying boat should naturally keep as accurate a position as it can, but, because it works from a shore base, its own safety does not depend on the accuracy of its navigation; one should always be able to find the land even though it be only a small island.

The safety of a ship-borne aircraft is almost entirely dependent on its navigation; to go out from a ship in the open ocean, to remain out of sight of her for three or four hours, and to find her when you come back, requires more skill than many people possess. The feeling of anxiety when one is due to sight one's parent ship after a long patrol can be realised only by those who have experienced it.

It may be that technical developments in the improvement of navigational instruments will simplify this problem, but they do not exist yet, and there is at present a good chance that aircraft sent out on a long flight from a single ship will fail to find her on return, and that an aircraft having a ship under observation will report her position with such error that other aircraft sent out to observe or attack her will not reach her.

Turning now to the factor of weather, we find again the flying boat, working from a sheltered base, can operate efficiently in almost any weather a ship can; if they can see, they can usually fly; and if they cannot see, no more can a ship. Contrary to this, a ship-borne aircraft, which we must assume to be small, and which must land on the sea, is very restricted by weather; it is difficult to imagine any small aircraft being able to alight and to be hoisted into a ship in a rough sea, however cunning are the devices to help it.

These remarks on weather, when referring to ship-borne aircraft, are intended to apply to cruisers on the trade routes carrying (say) four aircraft. Aircraft carriers on the trade routes have not been visualised. There is the possibility that a "flying deck cruiser" can be designed, capable of landing aircraft on her deck, and yet also of engaging other cruisers in equality. But there again such a vessel does not exist at present and may be impossible to design.

VI. *Effect of Air Power upon Trade on the Ocean Routes.*

We have now considered, at some length, the capabilities and limitations of aircraft in their work either for or against the safety of trade and we may now come to draw some conclusions. Most of our merchant ships are either on an ocean route or could be diverted to one if it were found essential to divert them ; it would be a serious but not an insuperable problem to do this What then would be the effect of enemy aircraft on merchant ships which were mainly on the ocean, and which never came within 400 or 500 miles of an enemy air base ?

It is submitted that those ships will be safer than they have ever been before. Aircraft cannot attack ships effectively so far at sea, even though the scouts may possibly find them. It would be a waste to allocate aircraft for this purpose, unless perhaps the ships are in convoy, which they should not be. It may be said that the great menace to merchant ships, what frightens them most, and what prevents them putting to sea, is the threat of enemy surface raiders who may be met with anywhere. Nowadays, and due to the introduction of aircraft, the chances of success of raiders are greatly reduced ; a raider relies chiefly on secrecy and evasion for her success. Aircraft, however efficient or inefficient they may be, act against secrecy, and tend to let everyone know what everyone else is doing. The raider may, of course, have her own aircraft, which may sight her pursuers, but that is far outweighed by the disadvantage of being sighted herself.

VII. *The Part which Aircraft can Play in the Control and Examination of Shipping in the Narrow Seas.*

The International Law is that merchant ships must be visited and searched before capture, and they must not be destroyed until the crew have been placed in safety. We must consider to what extent aircraft can perform this duty. It is quite clear that one aircraft cannot do this alone, however large it may be, and even though it may be equipped with a small boat. An aircraft on the water is very helpless and a ship wishing to resist could very probably destroy her.

It has, however, been suggested that aircraft working in pairs could carry out some form of examination service ; one alighting to visit and give orders with the other flying overhead to enforce them. This might be possible, but, it is thought, very doubtful. If the ship is to be ordered into harbour it is always difficult for the aircraft to escort her there, and almost impossible in darkness ; if the examination is to be carried out on the spot, there is always the weather restriction and besides the ship might " accidentally " ram the aircraft and its companion would be unable to say whether on purpose or not. It is out of the question for aircraft to make any arrangements for the safety of the crew.

The only satisfactory solution appears to lie in the co-operation of aircraft, who find the merchant ships, with warships, who escort them into harbour or board them. An entirely different state of affairs arises, however, in the case of a country which departs from

International Law, and one must imagine an "unrestricted air blockade" similar to the submarine blockade instituted by Germany in the Great War. If the opinions in Section *III* are true, aircraft which attacked merchant ships on sight could create havoc among them and form a most serious menace to trade passing within effective air range.

VIII. Experience of the War, 1914–1918.

It is submitted that the main lessons to be drawn from former wars are lessons in strategy, tactics, leadership and morale; there is seldom much to be learned from the weapons used in them. From the point of view of sea warfare, there was little air strategy or tactics because there were no aircraft carriers as we know them now, nor any catapults. One aircraft sighted the German Fleet at the Battle of Jutland, but its reports were not of value. Shore-based aircraft did a lot of patrolling; they often sighted submarines, both real and imaginary, and they occasionally sank them; the number is somewhat in dispute, but it was probably four. Doubtless they foiled some attacks by keeping the submarines submerged and so preventing them from coming to a favourable position for attack.

But aircraft in those days could fly neither far nor fast, and the weapons carried by them and used against them were alike primitive in the light of present knowledge. It is not considered that it is justifiable to draw lessons from the last War except in so far as it proved the courage and hardihood of the aircraft crews under the arduous and uncomfortable conditions in which they worked.

Those whose views are anti-air point to such incidents as the unsuccessful bombing of the Goeben when she was aground in the Dardanelles, but it is not believed that this incident has any application to the present day. Similarly, those who are pro-air claim, quite correctly, that no convoy escorted by aircraft lost a ship; on the other hand, only a small proportion were escorted by aircraft. The writer spent two years in destroyers escorting convoys and no ship was lost, but he is far from inferring that his presence was in any way responsible for their immunity from attack. Since then, for very many hours he has searched for submarines from aircraft, but, even when knowing them to be present, has sighted only a few.

Many other claims and counter-claims based on the War have been put forward, but usually by those who are trying to make a case for the air or against it. It is unfortunate that this still goes on—the Air Force boosting the efficiency of the new arm, the older Services resenting an encroachment on their own preserves. It is generally more interesting and easier to write an article for the express purpose of either proving or disproving existing theories than to strike what is probably a compromise. The present writer has spent twenty-four years in the Navy, the last twelve of them in association with the Fleet Air Arm, and he is honestly not aware of any bias as between ships and aircraft either one way or the other.

IX. *Conclusions at the Present Time.*

To summarise the conclusions which arise out of the above remarks and opinions it seems safe to say that trade on the ocean routes, which has always been fairly safe from submarine attack, is not menaced by air attack; in fact, it is safer because its great enemy, the raiding cruiser, cannot escape detection as she used to do.

Trade is also safer, though by no means immune, from submarine attack, because aircraft are a great hindrance to submarines. As a partial set-off against this, ships are safer from submarines in convoy, and from aircraft, separated; if there is danger from both at the same time, they may lose safety on balance.

At great trouble and expense, trade can usually be diverted from the most dangerous routes, but if this is impossible merchant ships are exposed to somewhat greater danger from a combination of ships and aircraft if International Law is respected and to far greater danger from aircraft if it is not.

In the case of Great Britain becoming involved in a war with a country whose air bases were situated within easy reach of the English Channel and the London Docks, we should be facing a problem regarding trade more serious than we have faced before. But against a country not within easy reach we should be better off.

X. *The Future.*

The whole problem would be changed if aircraft grew large as some people think they may; one hears and reads of fantastic theories of "battleships of the air"; it is, however, pointed out that trade also could then be air-borne. Such an eventuality can, it is thought, be discarded in the light of present knowledge. It is fundamental that the weight of a ship is taken by the water, but that the weight of an aircraft is not taken by the air. Unless there comes some revolutionary invention whereby much power can be produced with little weight (such as exploding atoms) the size of aircraft can only gradually increase with more efficient engines and design, and this would not materially affect the subject under discussion.

Airships, owing to their enormous endurance, would be most valuable for reconnaissance over the ocean in search of merchant ships or raiders. There have, however, been many airship disasters, and the writer knows so little about airship construction that he is unable to express a sound opinion as to their future.

There comes also to be considered what developments the future may hold regarding the efficiency of anti-aircraft fire. Aircraft will grow no smaller, while A.A. fire is certain to develop, as everything does—it has taken extraordinary strides in the last five years. We can say that the menace of A.A. fire will increase. It will, however, only increase against the aircraft which are sighted by the guns, and with more experience in air navigation and in concealment behind clouds or against sun, it may become more difficult to sight aircraft.

It is also possible (though rather unlikely) that means may be found whereby ships at sea will obtain more warning of the approach of enemy aircraft and whereby friendly aircraft may intercept and drive them off before they can attack successfully. Finally, it seems almost certain that the range of aircraft will slowly increase and that greater areas of water will be subjected to their search. It is the writer's opinion that the safety of trade, therefore, will remain much as it is at present, that is to say, as is given in the conclusions in Section IX above. As far as can be seen into the future, the chief change will be in the ever-growing difficulty of raiders to escape detection and attack.

H. J. Johnstone,
Commander, R.N.

CHAPTER XII.

UNITED STATES NAVAL AVIATION.

This article has been written in response to a request of the Editor for a review of the reasons that cause the United States Navy to have complete control of its own "air arm" and also for some account of the system in use to that end. It should be understood that only the writer himself is responsible for what is here written.

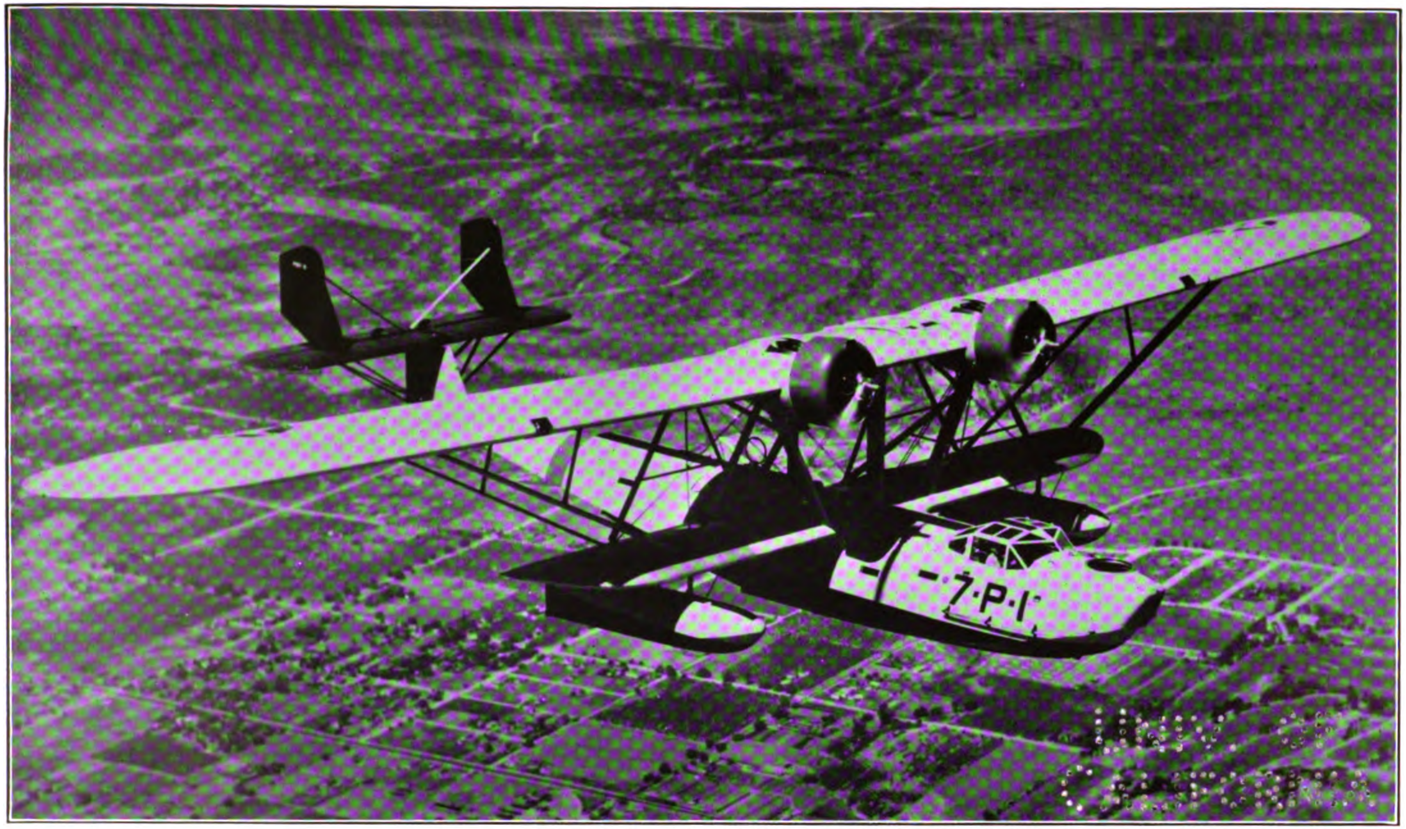
THE basic principle of the national policy of the United States as to its armed forces is that they are maintained solely for defence. The first principle of naval policy is to maintain the Navy at sufficient strength to support the national policies, to safeguard the commerce, and to guard the continental and overseas possessions, of the United States.

SOME GENERAL CONSIDERATIONS.

The first consideration of any country with respect to national defence must be premised on its geographical situation in connection with the geographic situation of potential enemies. For the United States, the geographic situation considered together with that of potential enemies reveals at once that not only must potential enemies proceed via the sea to attack the continental United States and, as well, its overseas possessions, but that the latter can only be defended via the sea. The consequent need of the United States for an adequate Navy is obvious.

The bases of maintenance of the Army and the Navy of the United States during peace are quite different. It is necessary that the Navy be maintained in a state of readiness for war conditions at any time, while the peace-time Army comprises a nucleus for expansion in time of national emergency. The Army will expand to many times its peace-time size before it becomes fully effective for war, while the Navy must be ready to withstand attacks immediately upon the existence of a state of war.

A Navy which is to satisfy these requirements must be the highest practicable embodiment of fighting power in all respects in all of its units. The United States Navy believes—and has so far successfully maintained its stand—that aviation cannot be used to its utmost capabilities except it be of the Navy, by the Navy, and for the Navy. Further, it is the general naval view that most of the arguments frequently advanced for a so-called "separate" or "independent" air force will not stand up under close examination and thorough analysis. Arguments are sometimes advanced that



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consolidation of air activities under one head will eliminate "duplication," bring about simplification of management, and so result in great economy. These claims cannot be reconciled with the facts when one stops to recognise—and to realise—that proposals for consolidation would necessitate the setting up of a new department in the executive branch of the Government—a new secretary with his essential staff, a new organisation complete with its various bureaus and offices (civil and military), its new auxiliary services, such as medical, supply, construction, public works, etc. An entirely new structure must be built up at large cost and maintained at corresponding expense. The answer appears plain that the setting up of such a new department cannot be expected to result in any economy but rather in increased cost.

Still another argument is appealing because, at first glance, it appears logical. This argument says that since there are three elements—land, sea, and air—therefore, it is in order to have land forces, sea forces, and air forces. The fallacy can readily be made apparent. Man is a land animal, dependent on the land for every means of survival. Navies cannot exist without contact and communication with the land. Air forces are dependent on the land, directly, or indirectly through ships at sea. It is true, and has been demonstrated throughout the centuries, that he who controls the land controls the situation. Control of the sea or of the air will, undoubtedly, be vital under many circumstances, but it is control of the land that is *always vital* and to which all efforts must be directed. The inability of air forces alone to seize and hold territory is obvious. Air forces are to-day valuable, in fact indispensable, in war operations on the sea or on the land, but their dependence on support from the earth's surface must be recognised. Again, navies can and do operate independently of the land for periods measured in weeks; airplanes cannot operate independently of the land, or of ships at sea, for periods measured other than in hours.

There is nothing of the miraculous in aircraft—they are conceived in the minds of men, built by the hands of men, and operated by men. They must, and do, conform to the laws of that fundamental science—physics, and to the applications of that science in the art of engineering. An over-loaded plane cannot fly (become airborne). The difference between its weight full and its weight empty is its useful load. The useful load must first be debited with the working load, which consists of the weight of crew and equipment, the weight of fuel and lubricants. The pay load (if any)—whether passengers, mail, freight, bombs, torpedoes, guns, and their ammunition—is the remainder after deducting the working load from the useful load. If there is more fuel for greater range or for greater speed, or both, there must be less pay load. There is in aircraft an inherent weight balance which governs the uses to which the weights may be put.

The argument of increased efficiency has been a standard one for years with proponents of an integral "Department of Air." If there are separate land, sea, and air forces, there will inevitably be innumerable situations requiring the co-operation and co-ordination of two forces and many that involve the three separate forces.

Experience—and common sense—indicates that provision of any arrangement to co-ordinate *three* services, as compared with *two*, would present a problem which would be difficult, if not impossible, of solution. The increase in difficulty is not, as might at first glance appear, of the order of 50 per cent., but rather of the order of more than 300 per cent., for co-ordination must be arranged not only between (A) and (B), but between (A) and (C), between (B) and (C), and finally between (A), (B), and (C).

Much is heard of the long-range striking capacities of aircraft having brought about a " new " strategy and " new " tactics, on the presumption that wars are to be waged as campaigns of terrorism by bombing and otherwise attacking non-military enemies. But raids, on large or small scale, have been commonplace land and sea operations since the beginning of time, and have been intended to serve the purpose of " terrorism " in innumerable instances. While " terrorism " may be adopted as an avowed war policy or one forced as reprisal, fundamentally all military objectives are those on the surface—on the land or on the sea. Air objectives are so nearly non-existent that they are admitted to be remote of attainment even by the ultra-enthusiasts of air power. Since air power is inherently incapable of independent operation and must rely on land (army) or sea (navy) forces, it follows that the best use of air forces is as components—and integral components—of the land and sea forces.

Again, if the idea of " separate " or " independent " air forces is to include the idea of military objectives also " separate " from or " independent " of the land and/or sea forces, surely the result will be dissipation and dispersion of the efforts of the national forces. All military efforts must be so co-ordinated as to apply the principle of concentration—an axiom which is the outcome of the experience of the ages. This is not to say that land (or sea) and air forces must necessarily attack identical objectives, but that objectives attacked must bear such military relation one to the other that the attacks on them shall have their due and powerful effect on each or both (or all) of them. This being the case, and keeping in mind the normal, inherent differentiation between land and sea objectives, it appears no less than wise to avoid the complications and inefficiency which are certain if fundamental facts are neglected.

As a variant of the proposals for a " united " air force, there are the recurring proposals—and arguments—for a single Department of National Defence, as to which it appears sufficient to point out that such an arrangement inherently includes the difficulties herein set forth and adds another—the super-staff of supermen who are to be sufficiently familiar with all three forces (land, sea, and air) to be capable of intelligent and effective co-operation and co-ordination of them in war operations. In the United States the President is Commander-in-Chief of the Army and Navy and controls them as two integral forces.

Aviation has become a powerful factor in naval warfare. It is considered absolutely essential that the Navy provide, train and control its air component, and that the air component be an integral part of the Navy. There is too much at stake for the Navy to take for granted that an adequate air component is any other than one thoroughly trained in the particular tasks of Fleet air work. The United States Navy considers itself fortunate in having an air arm that has grown up with, lives with, speaks the language of, and is an integral and vital part of, the Fleet.

The general policy of the United States Navy as to aviation is, therefore, that naval aviation is an integral part of the Navy itself, and the functions of naval aviation are derived directly from functions of the Navy. All the capabilities and endeavours of naval aviation are directed towards the promotion of naval efficiency and are designed to enable the Navy better to perform its functions. In naval aviation the reliance of ships upon aircraft and of aircraft upon ships, the sameness of their objectives, the consequent co-operation needed between these two essential parts of the Navy, the resultant necessity for co-ordination of their employment through one high command—all require that naval aviation, as it is conceived to-day, and as it may be expanded to-morrow, be an integral part of the Navy. That this is so is due to the wisdom, foresight, and sound views of those who have controlled the development of the Navy since aviation became a factor in warfare—and to none of these more than to the late Rear-Admiral Moffett, who was Chief of Bureau of Aeronautics from its creation in 1921 until his death in the Akron in 1933.

Aircraft have not so far supplanted any other naval type, but they have added power and effectiveness to the existing types. They constitute a striking force that has gone far towards increasing the value of the United States naval forces. The Navy is the first line of defence, and naval aviation can now truthfully be regarded as the advance guard of this first line.

THE HEAVIER-THAN-AIR SITUATION.

The policy of the United States Navy in regard to heavier-than-air aviation is to build and maintain airplanes to the full complement authorised for aircraft carriers and tenders, battleships, cruisers, and the Fleet Marine Force, and to develop the types of airplanes and appliances which are best suited for increased effectiveness of naval vessels, for attacks on all classes of naval objectives, for scouting and patrolling, and for the protection of seaborne trade.

The planes of the Navy differ from those of the Army to as great an extent as do the missions of the two services. They are built with the smallest wing span practicable so as to facilitate operations from on board ship ; they must be structurally stronger than other military planes to withstand the strains incident to landing into the arresting gear of the carriers, launching via the catapult method from the battleships and cruisers, and later being hoisted aboard. They must carry radio equipment and navigational instruments, with additional weight in the form of flotation gear both for the planes and for personnel, while at the same time making minimum sacrifice of speed or of range.

A means for carrying, maintaining, and efficiently operating aircraft on the decks of the Fleet has been accomplished. Each battleship, each cruiser, and each aircraft carrier carries her complement of planes. Aircraft units assigned to vessels form an integral part of the organisation of those vessels. Aircraft organisations assigned to and quartered on board carriers, tenders or other aviation vessels, constitute the air department of such vessels. Aircraft organisations assigned to other vessels (battleships and cruisers) of the Fleet usually constitute a part of the gunnery department of such vessels.

Experience has served to confirm the essential fact that airplanes in themselves are not capable of operating as independent units over the vast areas of the open sea for indefinite periods. Therefore, the naval force cannot avail itself of the advantages inherent in air operations unless it provides, in the Fleet itself, means for carrying. maintaining, and efficiently operating aircraft in whatever area it becomes necessary to exert sea power, and unless through constant training there are developed methods for harmonious co-operation between air, surface, and sub-surface activities. Through such constant training and indoctrination the methods of co-operation have now reached the point where aircraft in United States Fleet activities are accepted as a commonplace part of the day's work. Air and surface craft work in the closest harmony, each supporting and complementing the efforts of the other in resisting attack. The mission of the fleet aircraft is to assist the battle line to the maximum in defeating the enemy. With this aim always in mind various missions for aircraft have been so worked out and the various types of aircraft so designed as to carry out the assigned and delegated missions to best effect.

The heavier-than-air operations of naval aviation embrace three distinct fields, separate as to equipment and functions, but closely related in that each depends on the other, and the Navy as a whole, for its support and its effectiveness: first, the patrol type—the "flying-boat"; second, the seaplanes which are launched from the catapults in the battleships and the cruisers; third, the landplanes which are the complement of the airplane carriers.

The characteristics and functions of the first general class of naval aircraft, that of the patrol planes, are well defined: capacity to operate over great distances at sea, to be self-sustaining to a much greater degree than other types, to be powerful offensively and defensively, and, as well, to be capable of independently joining the Fleet at a given time and place ready to take part in whatever action may be required.

The second general type of naval aircraft operation is that of the small seaplanes of observation and scouting types which are employed by the battleships and cruisers of the Fleet. These types may be considered as service machines; that is, their function is to be of direct assistance to the individual ships from which they are flown. It would be impossible to take full advantage of the great range of the big guns of the modern battleships unless aircraft were available to direct and correct the fire of these guns, for the target may be extremely difficult, if not impossible, to see from the tops of the ships. Every major vessel (cruiser as well as battleship) carries from two to four of these planes which, when their services are required for the spotting of gunfire or the search for and observation of enemy vessels, are launched by being catapulted. Upon completion of their mission they land on the sea, are hoisted back on board their ships, and are again prepared for flight.

It is the duty of the personnel of scouting and observation planes to report by radio, giving the commander-in-chief complete information essential to disposing and preparing his fleet for battle, and for the conduct of the battle once the forces are engaged. This is a particularly important duty for any officer to perform. He is required to furnish the commander-in-chief with complete information of every character. This requires highly technical knowledge of naval tactics, and recognition of all types, formations and dispositions of naval forces, together with the significance of these formations and movements of the enemy. False or incorrect information may lead a commander-in-chief into a fatal mistake. A naval aviator in a scouting plane occupies a position of peculiar and independent responsibility.

The third, and one of the most important classes of naval aviation operation, is that of carrier aircraft. This is a relatively new weapon and takes its place in the Fleet as a means of carrying on an important offensive comparable to that of the guns and torpedoes of battleships, cruisers, destroyers, and submarines. The carriers themselves are but the bases from which the planes fly off and to which they return for re-servicing. The aircraft carrier is a good illustration of the intricate problems of adapting aviation to naval needs.

Carrier aircraft have a single function, the offensive; that is, to find and to strike the enemy, both on the surface and in the air. The types of planes employed are determined by this objective. First, the enemy must be located, so scouting planes are necessary to the complement. These planes, equipped with high-powered radio, search wide sea areas in the direction where the opposing force is expected to be found. When the enemy is so located, an attack group is sent out. This consists of bombing and torpedo planes whose purpose is to damage or destroy the enemy surface vessels exactly as do the guns of the battleships and the cruisers. Finally, there are the small high-performance fighting planes whose principal mission is to destroy enemy aircraft, but which may, as an additional function, be used to strafe the lighter ships and the upper works of heavy ships of the enemy with machine guns and light bombs.

Mention of yet another category of naval aviation is essential for appreciation of the scope covered. The Fleet Marine Force, whose function is indicated by its name, has included in it a due comment of aircraft squadrons of character similar, where not identical, to carrier aircraft. These squadrons are, of course, manned by marines whose differences from their naval brothers-in-arms are chiefly those of uniform and of differing experiences subsequent to qualification as pilots at Pensacola, although they are also schooled in carrier work at sea.

The Lighter-than-Air Situation.

The policy of the United States Navy as to lighter-than-air aviation is to maintain as necessary the rigid airships now built and building to determine their usefulness for naval and other governmental purposes and their commercial value, and to build and operate such non-rigid airships as are necessary for training purposes and to determine their value for naval use.

The current situation as to lighter-than-air aviation, at the time of writing, is that the loss of the Macon has brought about the formation of a committee of eight distinguished civilian scientific engineers (known as the Durand Committee, after Dr. Durand, its chairman) to review and analyse the past and present design and construction of rigid airships and to make recommendations as to their future design and construction. While a preliminary report is expected early in 1936, the final (technical) report will probably not be had before the summer of 1936.

The case for the rigid airship lies in its use primarily as a " scout cruiser of the air," and as such, perhaps largely to provide " negative information." When it is realised that, while carrying as many planes as a cruiser, it has more than twice the high speed of the cruiser and at the same time twice the endurance of the cruiser at high speed, it appears obvious that it affords scouting capabilities that cannot be overlooked.

Pending the reports (preliminary and final) of the Durand Committee (and the consequent consideration and action thereon of the Navy Department), the general lighter-than-air situation remains in *status quo.* All existing lighter-than-air activities are concentrated at the Naval Air Station at Lakehurst, New Jersey, where exercises and training with non-rigid airships go forward.

The Bureau of Aeronautics.

The Bureau of Aeronautics (one of seven principal Bureaus of the Navy Department), under the direction of the Secretary of the Navy, is charged with and responsible for all that relates to the design, construction, fitting-out, testing, repair, and alteration of naval and Marine Corps aircraft and, except as specifically assigned to other cognizance, of all instruments, equipment, and accessories pertaining thereto. It provides aircraft in accordance with approved operating plans. It is charged with the upkeep and operation of all the aeronautic shore establishments of the Navy and Marine Corps and with their repair, except such direct cognizance of public works and utilities as is vested in the Bureau of Yards and Docks. The Chief of the Bureau of Aeronautics is appointed by the President, with the advice and consent of the Senate, for a term of four years.

The Bureau of Aeronautics makes recommendations covering all aeronautic matters as to operations, personnel and material to the appropriate Bureaus and Offices of the Navy Department, including the Headquarters of the Marine Corps. It co-operates with the

Bureau of Navigation in the development, procurement, and distribution of aircraft navigational methods and in the design and development of aeronautic navigational instruments. It co-operates with the Bureau of Engineering in matters relating to the design, manufacture, installation, maintenance, repair, and operation of aircraft radio equipment. It co-operates with the Bureau of Ordnance in all matters pertaining to aeronautic ordnance, design, and production; and with the Bureau of Construction and Repair in regard to the aeronautic accessories that are an integral part of the structure of any surface or sub-surface vessel.

In addition to its functions of supplying the Fleet with the best possible equipment, the Bureau of Aeronautics acts in an advisory capacity to the Chief of Naval Operations and all other bureaus and offices of the Navy Department as concerns aviation matters in general. This is necessary due to the fact that aviation is a highly specialised branch of the Service which has not been in existence long enough for the officers of the Navy, as a whole, to have gained the same knowledge of this branch of the Service as they have in regard to ships and other component parts of the Navy.

THE SHORE ESTABLISHMENT.

The aviation shore establishments meet a variety of naval needs but are kept at the minimum consonant with those needs. Shore bases are required for ship-based aircraft in the same manner as overhaul yards and home bases are required for ships of the Fleet. The Fleet is actually based on land, which means that it must obtain its sustenance of all kinds from the land. From its land bases it obtains fuel, personnel, provisions, ammunition, and the vessels of the Fleet must return to their bases periodically for repairs and dry-docking. Ship-based aircraft are even more dependent on land bases than the ships themselves, since a large portion of their training must be done ashore before they are competent to operate from ships. For reasons of fuel economy, carrier-based squadrons, with their entire complements of personnel, operate several months of each year from Fleet air bases.

Shore bases, whether permanent or temporary, with sheltered waters adjacent to the open sea, are essential to the operation of patrol planes. The Navy is responsible for the protection of our commerce in our sea lanes, and experience has demonstrated that the only practical means of accomplishing this important naval function is a combined force of surface vessels and patrol planes.

In addition, naval aviation maintains certain other shore establishments, some of which play important roles. The Naval Aircraft Factory at Philadelphia investigates and experiments with almost every kind of aeronautical material and appliance, manufactures certain airplane parts, and builds complete planes. The aviation unit at Newport, Rhode Island, functions in connection with the Torpedo Factory and School at that place. The naval air detail at Dahlgren, Virginia, assists the Naval Proving Ground at that place in the test and development of aviation ordnance. The air unit at Annapolis exists primarily for indoctrinal flight training of midshipmen. Mention will be made elsewhere of the flight training establishments.

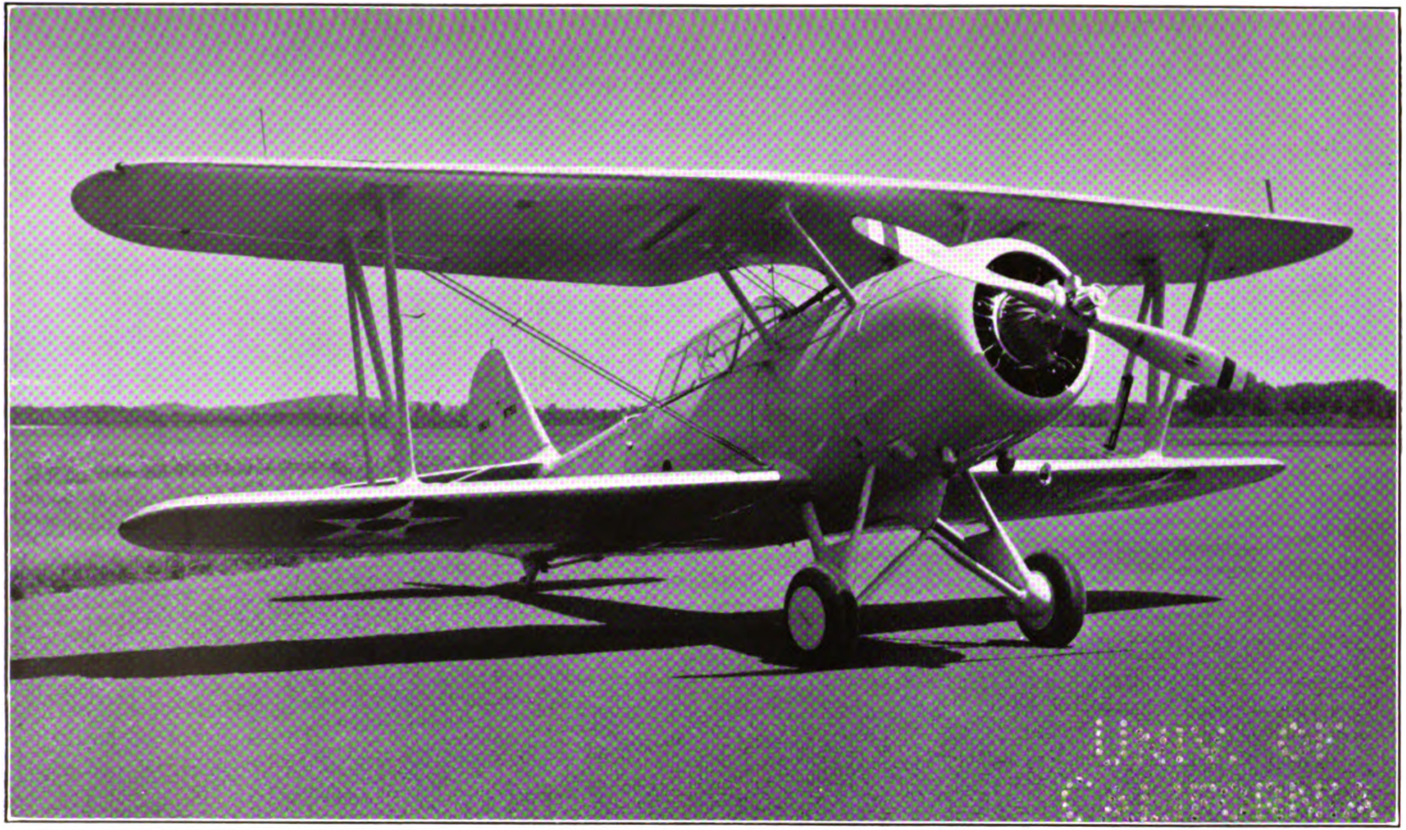
Finally, the shore establishments include naval reserve aviation bases located near the larger population centres where officers, basically trained at Pensacola and with one or more years of experience in active duty in sea-going aircraft, are organised in aviation units which afford them opportunities to maintain their aviation capabilities while pursuing their civil vocations. These units constitute an important and efficient reserve for the Fleet.

Aviation Personnel.

In order fully to understand United States naval aviation it is important to realise that there is no separate air corps in the Navy. The naval aeronautical organisation is composed of officers and men of the regular Navy, and service in the air component is voluntary. Naval aviators are chiefly line officers who have specialised in aviation. They are not only required to be expert aviators but they are also required to keep themselves in training by actual duty in surface vessels, to perform the general line duties of their rank so that at any time they may be detailed to general line duty aboard any ship. The Navy is, therefore, not faced with the problem of finding employment for aviation personnel when for any reason their service in aviation duties terminates.

The basic training establishments for naval aviation are two—that for lighter-than-air at Lakehurst, New Jersey, has already been mentioned. All heavier-than-air basic training is carried on at Pensacola, Florida. The entire course at the Naval Aviation Training School at Pensacola is designed not only to teach the student how to manipulate an airplane, but also to give him the fundamental instruction required for the operations of aircraft in the Fleet. Naval aviators are trained thoroughly in both land and seaplanes. In addition to regular flight instruction, they are taught aerial navigation, torpedo dropping, bombing, and aerial tactics as relating to naval tactics, and are required to become proficient radio operators. The nature of the operations of aircraft in the Fleet is decidedly different from that of operations at an Army shore station or with the Army, and therefore the course of training (other than the elementary principles for the manipulation of aircraft) for naval aviators should and do differ radically from those of Army aviators. They are then trained at sea on board aircraft carriers and other vessels carrying aircraft. Only after these years of training in seagoing aircraft are they considered real naval aviators.

The Navy is of the firm opinion that it takes a great deal more than the ability to fly an airplane to meet the demands of naval aviation. An efficient naval pilot must have a thorough knowledge of the Navy, its doctrine, customs, and needs. The years spent at the Naval Academy and as a junior officer in the Fleet are considered necessary properly to ground a naval officer in his profession. Additional years must be spent becoming proficient in the field of



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navigation, gunnery, radio, engineering, the problems of command, the wide field of strategy and tactics. And, in order that the fine co-operation, which is attained through this system, shall be maintained, the naval aviator, when not actually flying, performs the regular duties of a line officer aboard ship. As a result of this system a naval aviator never loses contact with his basic profession and keeps constantly in touch with the developments and advances made in surface craft.

It requires years to train the crews of modern warships—seamen and petty officers are increasingly specialists and technicians whose education must be painstaking and laborious. It is from this highly trained group that men are selected for additional training in the science and art of aviation. Consequently, the enlisted men in naval aviation are a handpicked group of the most intelligent young men in the country. Most of them are high-school graduates, and some have been to college. They are trained to become pilots, mechanics, gunners, bombers, radio operators, etc., of the highest skill and reliability.

Experience has proved the wisdom of this policy of manning naval aviation with regular naval personnel, for only men so trained fully appreciate the needs of the Navy and can co-operate to the fullest extent. On the other hand, naval officers who are not qualified as pilots are becoming more intimately acquainted with aviation through daily contact with its operations from the ships on which they are stationed, by indoctrination flights and by actual duties as observers in aircraft. In this way are the possibilities and limitations of aircraft appreciated. Between the man on the bridge of a surface ship and the man at the controls of a naval airplane there is complete understanding and, therefore, complete co-operation.

Summary.

The foregoing explanation of the subjects of organisation, personnel, and types of planes required and possessed by the naval aviation arm of the United States Navy is intended to outline the inherent relationship which exists between naval aviation and the United States Navy. To this policy is due, in no small measure, the high state of efficiency which has been attained. To loosen the coherence of this structure in any way would most certainly lessen the efficiency which has been so painstakingly built up from the days of the inception of naval aviation.

Not only in ordinary sea operations is integral naval aviation considered of vital importance, but when it comes to overseas operation aviation is particularly dependent on the surface navy to furnish logistic requirements necessary for continued and extended operations. It is difficult to visualise how aviation could function on its own as an independent force in an overseas compaign. Certainly if such a plan were followed it would court both a considerable wastage of effort and a probable failure in the attainment of desired objectives. All plans and operations of the air forces must be directed so as to fit into the various phases of the military campaign, step by step. The fundamental idea of cause and effect behind all aerial operations is the situation on the surface—land or sea.

The surface navy must be able to depend on its air force for the accomplishment of all the various tasks within the capabilities of aircraft. This dependence must be based on known capabilities of both the personnel and material of the air force and on the principle of unity of command. These tasks are so closely allied with those of the surface force and so vital to their success that they cannot be considered separately. Modern naval operations cannot be efficiently conducted without such services acting as integral parts of a single command. Moreover, the training of these air services that are to act with the Navy must be under the continuous direction and control of the command which is ultimately to use them in war. The surface navy must have within its organisation an air component adequate in types, numbers, and capabilities to meet all the likely situations that will arise.

One vital point which must be kept constantly in mind, in consideration of United States naval aviation, is that it is an integral part of the United States Navy. All efforts in the field of naval aviation development are designed to further naval capabilities and to fit the Navy better to perform its essential functions in national defence. Naval aviation in the United States Navy has reached the position to-day where it is very highly developed and efficient, and it has become so by reason of its being developed wholly by the Navy, of the Navy, and for the Navy. Those of us who are charged with the present and future development and expansion are convinced that its continued successful operation demands that it should remain as a component and inseparable part of the Navy.

Ernest J. King,
Rear-Admiral, U.S. Navy,
Chief of the Bureau of Aeronautics.

CHAPTER XIII.

NAVAL AIRCRAFT PRODUCTION.

BEFORE aviation had emerged from its chrysalis its military potentialities had been realised. Even the dreamer could conceive the aeroplane as a scouting weapon although the responsible military authorities did little to encourage the pioneers. Naval aviation owed its inception in 1911 to private enterprise, as the first four officers were taught to fly, with Admiralty permission, by Mr. G. B. Cockburn on two Short biplanes which were the property of Mr. (now Sir) Francis McClean. In the same year Commander Oliver Schwann, R.N., at his own expense, converted an Avro biplane into a seaplane and succeeded in making, within the confines of Barrow Dock, the first British flight off salt water.

In May, 1912, the Royal Flying Corps was formed to consist of Military and Naval Wings and a joint Central Flying School. On the creation of the R.F.C. the First Lord of the Admiralty created a special department at the Admiralty, known as the Air Department, to deal with all questions and organisation relating to aircraft in connection with the Navy, and appointed Capt. Murray Sueter, R.N., to be Director. Under this enterprising officer naval aviation made noteworthy progress. The Admiralty, unlike the War Office, gave great encouragement to the infant aircraft industry, and set about investigating every phase of aviation which would seem likely to assist naval tactics. By the time that the independent Royal Naval Air Service was formed on July 1, 1914, naval aviation had attained considerable importance in the eyes of those who could visualise its future potentialities in spite of its early limitations.

The successful conduct of naval operations left little room for the introduction of new and untried weapons, and aviation, struggling to justify itself in a new element, received little sympathy from those who were apt to expect too much from it in its infancy. The peculiar requirements of naval air operations—" distance reconnaissance work with the fleet at sea " and " reconnaissance work off an enemy coast, working from detached cruisers or special plane ships," to quote two of the duties of naval aircraft outlined in a memorandum laid before the Board of Admiralty by Capt. Sueter in 1912—called for specialisation at a time when the impoverished aircraft manufacturers were more concerned in combating the War Office policy of standardisation which was threatening to stultify progress and turn half of the firms out of business.

Unlike that of the War Office, the Admiralty policy encouraged aircraft manufacturers to produce original designs, and although it did not rely on any particular firms to supply its needs, a number of companies devoted their attentions to certain naval requirements at the inspiration of the Admiralty. It is interesting to note that many of these firms remain to-day as the principal suppliers of naval and sea-going aircraft for the Royal Air Force.

This is not the place to discuss the historical aspect of naval aviation, most of which has already been fully dealt with in previous issues of the " Naval Annual," but it is important to emphasise that the policy instigated by the Air Department of the Admiralty in 1912, and persisting until the pooling of aircraft orders became necessary on the formation of the Royal Air Force in 1918, resulted in R.N.A.S. aircraft being superior to the standardised equipment of the R.F.C. in efficiency and ability to fulfil the tasks allotted to them.

The fusion of the Royal Naval Air Service and the Royal Flying Corps into one service came at a time when aircraft production had reached a critical point. Naval requirements in their broader aspects were falling into pre-determined channels, and co-ordination to eliminate useless and time-wasting duplication was imperative. The widespread ramifications of the British services, war wastage, the requirements of our allies, etc., demanded an output such as no industry had ever been called upon to produce. The conflicting policies of the services, the troubles and storms over the Ministry of Munitions and the successive Air Boards of 1916, and the final unification of the air services are matters of history, but history which is well worth study if the lessons so hardly learnt twenty years ago are not to be wasted.

To-day harmony exists between the Admiralty and the Air Ministry. In the 1924 agreement between the two departments the latter assumed a substantial measure of control over air units operating with the Navy, but the Air Ministry retained its command of all technical and supply services. The formation of the Fleet Air Arm gave the Admiralty its air branch in so far as it concerned units serving in aircraft carriers and ships of the line and cruisers carrying aircraft, but absolved the Admiralty of all responsibility in maintaining technical services and training establishments which would duplicate those already maintained by the Air Ministry. Although there are many who would advocate a completely autonomous Fleet Air Arm analogous to the short-lived pre-War and War-time Royal Naval Air Service, there can be little doubt that, so far as production and supply are concerned, any return to a system which under stress of war revealed so many weaknesses would be retrogressive.

Unlike many other major industries, the aircraft industry is responsible for the production of a vehicle which, with comparatively minor differences, is applicable to both naval and military use, although these two uses are widely different in practice. Peace-time requirements, particularly those of the Navy, are limited, yet it is of the first importance that an industry capable of rapid expansion and of maintaining a high standard of technical efficiency should be maintained. Since the formation of the Fleet Air Arm the Navy has suffered from an official Government policy favouring limitation of naval strength, the unfortunate effects of which, in a disturbed world, have only just been realised. This policy has seriously interfered with the development of the Fleet Air Arm, the size and efficiency of which depends on the size and capability of the Fleet to absorb it.

We therefore come to the important question of Fleet Air Arm flying equipment, that is, carrier-borne and catapult-ship aircraft. The close liaison which exists between the Admiralty and the Air Ministry has been a most important factor in maintaining the high efficiency of all Fleet Air Arm equipment. The supply of aircraft is entirely in the hands of the Air Ministry, the Admiralty only submitting its requirements to the responsible Air Ministry authorities for them to draw up specifications for issue to the industry The organisation of the aircraft industry is based on the technical requirements of the Air Ministry which cover every stage in the production of raw and finished materials, and the design, construction, inspection and testing of aircraft, aero-engines, accessories and equipment. The Admiralty, therefore, has the advantage of using an existing organisation and is able to apply a large proportion of its comparatively small appropriations for the Fleet Air Arm to the acquisition of aircraft.

The modern tendency in military aircraft design is towards a reduction in the number of types necessary to fulfil adequately the requirements of the services. The small size of the Fleet Air Arm, coupled with the fact that its activities are limited to purely active service operations with the Fleet, results in the total number of aircraft necessary to meet the needs of the Navy of the present day being comparatively small.

The functions of naval aircraft may be divided into four categories—reconnaissance, gun-spotting, torpedo and bomb dropping, and fighting. These functions are performed by four types of aircraft—the three-seat spotter-reconnaissance machine, the two-seat torpedo-bomber, the two-seat fighter-reconnaissance machine and the single-seat fighter. More recently the desirability to reduce the number of types has resulted in the appearance of the torpedo-spotter-reconnaissance machine capable of fulfilling three distinct duties previously done by two different types of aircraft. The advantages of such a type are appreciated if it is realised that the number of aircraft operating with the Fleet is limited by the aircraft-carrying capacity of the ships concerned.

The principal suppliers of aircraft which fall into these naval categories are the Blackburn Aeroplane & Motor Company, Ltd., the Fairey Aviation Co., Ltd., and Hawker Aircraft, Ltd. These three firms have, since their inception, devoted considerable attention to the requirements of the Admiralty, and, since the formation of the Fleet Air Arm, have been responsible for the production of the bulk of naval aircraft.

The Blackburn Company has specialised in the design and production of torpedo-carrying aircraft since 1917, and would appear to have established a monopoly in the production of this class of aeroplane in spite of the fact that many other firms have, during the past ten years, produced experimental types of torpedo-carriers to conform to official specifications. The "Dart" single-seat torpedo-dropper, the "Ripon" and "Baffin" two-seat torpedo-bombers, and the "Shark" two-three seat torpedo-spotter-reconnaissance biplane represent a succession of types which have gone into service with the Fleet Air Arm over the past twelve years.

The Fairey Company originally produced their type III reconnaissance aeroplane in 1916, and successive developments of this model—the IIIC, IIID, IIIF and "Seal"—have been used for naval work. In 1924 the Fairey Company produced the "Flycatcher," the first single-seat fighter specifically developed for Fleet work, and this type bore the entire brunt of naval air fighting duties for ten years. During 1935 the Admiralty adopted the Fairey "Swordfish" two-three seat torpedo-spotter-reconnaissance biplane which conforms to the same specification as the Blackburn "Shark."

The Hawker Company, as distinct from its predecessor the Sopwith Aviation Co., Ltd., which played a very important part in the development of pre-War and War-time naval aviation, may be said to have evolved two representative types of military aircraft —the "Fury" single-seat fighter and the "Hart" two-seat day bomber—whose remarkable all-round efficiency has rendered them particularly suitable for widespread adaptation. From the "Fury" was evolved the "Nimrod" single-seat Fleet fighter, and from the "Hart" was developed the "Osprey" two-seat Fleet fighter-reconnaissance biplane.

On these three firms has rested the responsibility for equipment of the Fleet Air Arm to the present day. Although the Blackburn Company has specialised in the development of torpedo aircraft and has been singularly successful in its work, its activities have not been confined solely to the production of this type of aeroplane. The limited requirements of the Fleet Air Arm would not, at the present juncture, justify any one firm concentrating its entire efforts on the production of naval aircraft, and even if conditions should arise which would call for a considerable expansion in Fleet Air Arm equipment it is extremely unlikely that any particular firms would be called upon to devote their entire attentions to naval aircraft other than in a purely mass-production capacity. Technical development would still be left open to the entire industry in order that full advantage could be taken of the principle of competitive design. In a major emergency, that is, in the event of war, it is likely that certain branches of the industry would be put on to the development of certain aircraft types with which they have had the greatest experience or success, but no firm with a fully competent design staff would be deprived of the opportunities of submitting designs to conform to specifications and requirements of all branches of the flying services.

The productive capacity of the three firms which to date have supplied the bulk of the requirements of the Fleet Air Arm is very extensive. The Hawker Company, through its parent company, the Hawker-Siddeley Aircraft Co., Ltd., is associated with Sir W. G. Armstrong Whitworth Aircraft, Ltd., and A. V. Roe & Co., Ltd., and it also owns the Gloster Aircraft Co., Ltd. There are, therefore, four modern and well-equipped factories available to undertake the production of Hawker aircraft. In the present expansion programme of the Royal Air Force, Hawker aircraft are being built in large quantities, not only by all the firms in the Hawker-Siddeley group, but by several other firms in the aircraft industry. Apart from the Hawker Company itself, the Avro, Armstrong Whitworth, Bristol, Westland, and Boulton Paul firms are producing Hawker aircraft in quantity in addition to the production of aircraft of their own design.

The Fairey Company has factories at Hayes and at Stockport, and its resources are more than sufficient to cope with the demands that are being made on the company by the present expansion programme. Similarly, the Blackburn Company has factories at Brough, near Hull, and in Leeds, both of which are capable of turning out large quantities of aircraft. The output of these three companies is almost entirely military, only the Blackburn Company devoting a small amount of attention to commercial aircraft.

The expansion programme instigated by the British Government in 1934, and speeded up in 1935, calls for the construction of approximately 1,500 aircraft by 1937. This number will be required to equip the new Home Defence squadrons which are to be formed, but does not include the large number of aircraft which will be required to re-equip existing units during the period of expansion. This programme falls easily within the scope of the British aircraft industry without any interruption of the extensive Imperial civil air programme which is in course of development and without calling upon any manufacturer to abandon the production of commercial aircraft or to refuse orders from abroad for either military or civil aircraft. No call is made on the number of smaller aircraft manufacturers, whose attentions are devoted solely to the production of light sporting and training aircraft. Although these firms are not equipped for the production of metal aircraft they represent an important nucleus by virtue of their trained personnel, and if not capable at the outset of turning out complete aircraft they would be in a position to undertake the manufacture of essential parts under sub-contract or to produce training aircraft.

In the Great War it was possible to recruit a large number of wood-working firms, such as motor coachbody-builders, piano manufacturers, cabinet and furniture makers, etc., to undertake the production of aircraft parts and components, and later complete aeroplanes, but with the evolution of the metal aeroplane, either metal-framed or all-metal, the augmentation of the aircraft industry in a major emergency would affect the specialist engineering industries. The unification of supply under one organisation results in a degree of standardisation which was unknown during the last War. The requisition of materials is made to the minimum of specifications, the interchangeability of parts and fittings is studied, orders are placed with due regard to the capacity of the firms to undertake the work and needless duplication, particularly in connection with the requirements of the naval and military branches of the Air Force which are common to one another, are eliminated.

In speaking of Fleet Air Arm equipment it must be remembered that we refer solely to ship-borne aircraft; that is, landplanes operating from aircraft-carriers and float seaplanes operating from catapult-equipped ships. Except for certain necessary modifications to suit such aircraft for catapult work and deck-arresting, the provision of interchangeable wheel and float landing-gear and the need for certain specialised marine equipment, Fleet Air Arm aeroplanes differ little from certain standard single-engined aeroplanes used in other branches of the Royal Air Force. As example, the Hawker "Osprey" two-seat fleet fighter-reconnaissance biplane is basically similar to the Hawker "Hart," "Hind," "Demon" and "Audax" two-seat biplanes used in large numbers for day-bombing, fighting and army co-operation duties in the Royal Air Force. The Hawker "Nimrod" single-seat fleet fighter is similar to the Hawker "Fury" single-seat interceptor fighter. The Fairey "Seal" is the naval counterpart to the Fairey "Gordon" two-seat day bomber. The essential air-frames of all these type have enough in common to allow for parallel mass-production to be undertaken with resultant economy and speed in the requisition of materials, parts and accessories from sub-contractors, and simplification of assembly either by the manufacturers or in the service.

Although coastal defence falls within the sphere of Air Ministry control aircraft employed for this work have certain marine attributes and in service are called upon to work in liaison with the Navy in many ways. The coastal reconnaissance flying-boat, although more fitted to oversea work than the carrier-borne landplane, must work from the shore base and therefore its activities in co-operation with the Navy are limited to work in the narrow seas. There are many who would decry the limitations of the flying-boats and compare them more than unfavourably with surface ships because of their inability to stand up to really heavy seas, but working from a shore base the big flying-boat is not necessarily intended to alight in the open sea. Heavy weather which is likely to hinder the operations of the flying-boat is also a disadvantage to the small surface ship, the work of which the flying-boat, with its extensive range and wide operating area, is intended to augment and sometimes replace. There is no doubt that the flying-boat, when called upon, will render invaluable assistance to the Navy in its shallow water operations, particularly in submarine spotting, mine sweeping and convoying operations.

The question of flying-boat production is therefore worth considering in this article. There are, at the moment, four firms engaged in the design and production of flying-boats in this country. These are Short Bros., Ltd., the Supermarine Aviation Works (Vickers), Ltd., Saunders-Roe, Ltd., and the Blackburn Aeroplane & Motor Co., Ltd. The building of flying-boats, or at any rate the construction of flying-boat hulls, is a specialised task involving methods approaching those of the boat-builder while still using the materials of the aircraft manufacturer. The present stage of development has not yet called for the establishment of permanent flying-boat slipways, although the time may not be far distant when such accommodation may be required for certain classes of flying-boats. In any case a works adjacent to water is essential and this fact limits expansion of flying-boat builders to firms located alongside, or with easy access to, water. Other than the firms mentioned above few aircraft manufacturers have suitably situated plants, consequently resource would have to be made to boat-building firms or even ship-builders, although in an emergency the latter would in all probability be heavily engaged in work of their own and would not be in a position to devote any part of their establishments to flying-boat construction.

Flying-boat superstructures, that is, the wings, tail-unit, engines and mountings, etc., conform to customary aircraft practice and would come within the scope of the aircraft industry and its ancillaries.

The biggest problem of any in the event of sudden mobilisation of the Air Force and aircraft industry would be in the supply of engines. Four aero-engine manufacturers supply the bulk of engines for all branches of the Royal Air Force. These firms between them produce a wide range of types of air-cooled and water-cooled engines suitable for all types of aircraft, but no particular type of engine is intended for any particular purpose. In the range of engines of powers ranging from 500 to 1,000 h.p. there is a choice of suitable power-plants. For example, the 500–600 h.p. Rolls-Royce "Kestrel" powers the Hawker "Nimrod" single-seat fleet fighter and the Hawker "Osprey" two-seat fleet-reconnaissance biplane; two are used in the Supermarine "Scapa" reconnaissance flying-boat and four in the Short "Singapore III" reconnaissance flying-boat. The Bristol "Pegasus" is used in the Fairey "Swordfish" fleet torpedo-spotter-reconnaissance biplane and the Supermarine "Stranraer" reconnaissance flying-boat uses two engines of this type. These engines are also used in large quantities in aeroplanes of the other branches of the Royal Air Force.

Any sudden emergency requiring extensive and immediate expansion of the Royal Air Force and the Navy and its Fleet Air Arm would place the biggest strain on the engine industry. The comparatively few firms producing high-powered engines suitable for military purposes would be called upon to supply the entire requirements of the Royal Air Force as a whole, and resource would have to be made to outside sources of supply, represented mainly by the motor-car industry and its ancillaries. That several motor-car firms realise the importance of aero-engine work is instanced by the comparatively recent re-entry of the Wolseley Company into the aero-engine industry with a range of radial air-cooled engines which, so far, have only been used for commercial purposes, and by the decision of the Alvis Company to erect a special factory for the manufacture of a foreign high-powered engine under licence.

The present expansion programme of the Royal Air Force, as has already been mentioned, is designed to double the first-line strength of the Royal Air Force in approximately two years This programme provides for the acquisition of 1,500 new aeroplanes, excluding machines for squadrons overseas and for the Fleet Air Arm, but including training machines and reserves. In the 1935–36 Naval Estimates provision was made for the increase of only nineteen first-line aircraft to the Fleet Air Arm, compared with an increase of twelve for the previous year. There has been criticism of this paltry figure when compared with the large Air Force home defence increase, but, as has already been emphasised, any substantial increase in the size of the Fleet Air Arm must depend on Admiralty requirements in regard to the number of ships with accommodation for aircraft. When the plans for the reconstruction of the British Navy are complete, there is certain to be an increase in the demands on manufacturers in this direction. Whatever the outcome it can be safely assumed that the aircraft industry as a whole can meet the demands of the Navy under all reasonable peace-time conditions, and would be able to rise to an emergency with an organisation which is as efficient as any in the world.

LEONARD BRIDGMAN.

CHAPTER XIV.

FLYING BOATS.

IT cannot be long before all the principal commercial centres and outposts of civilisation are linked together in a world-wide system of air communications. The development in air mail and passenger services grew rapidly during the decade which followed the War into the elaborate network of regular lines now existing on the Continent, in the United States of America, and in various other parts of the world. These systems are at present only linked together in places where no great distances have to be covered without alighting to refuel. Probably the longest span now regularly served is that between the West coast of Africa and South America. The present demand is, of course, for a means of connecting up all the systems with regular transoceanic services, and of extending them in new directions, so as to bring all civilisation within the scope of air transport.

Present-day developments indicate that this demand will be met by the evolution of what is now known as the flying boat. It is because of these indications that the relative importance of the flying boat in the field of aeronautical development has increased very rapidly during the last few years. One may say that the type has passed through three distinct phases. The first was a product of the War. Between 1913 and 1918 the growing requirements of naval coastal operations brought about a process of evolution from the little baby Bat-Boat produced by Sopwith, to the powerfully armed multi-engined giants (of their day), the Porte Boat, Felixstowe Fury, F 5, and other naval flying boats based at stations of the R.N.A.S. during the latter part of the War.

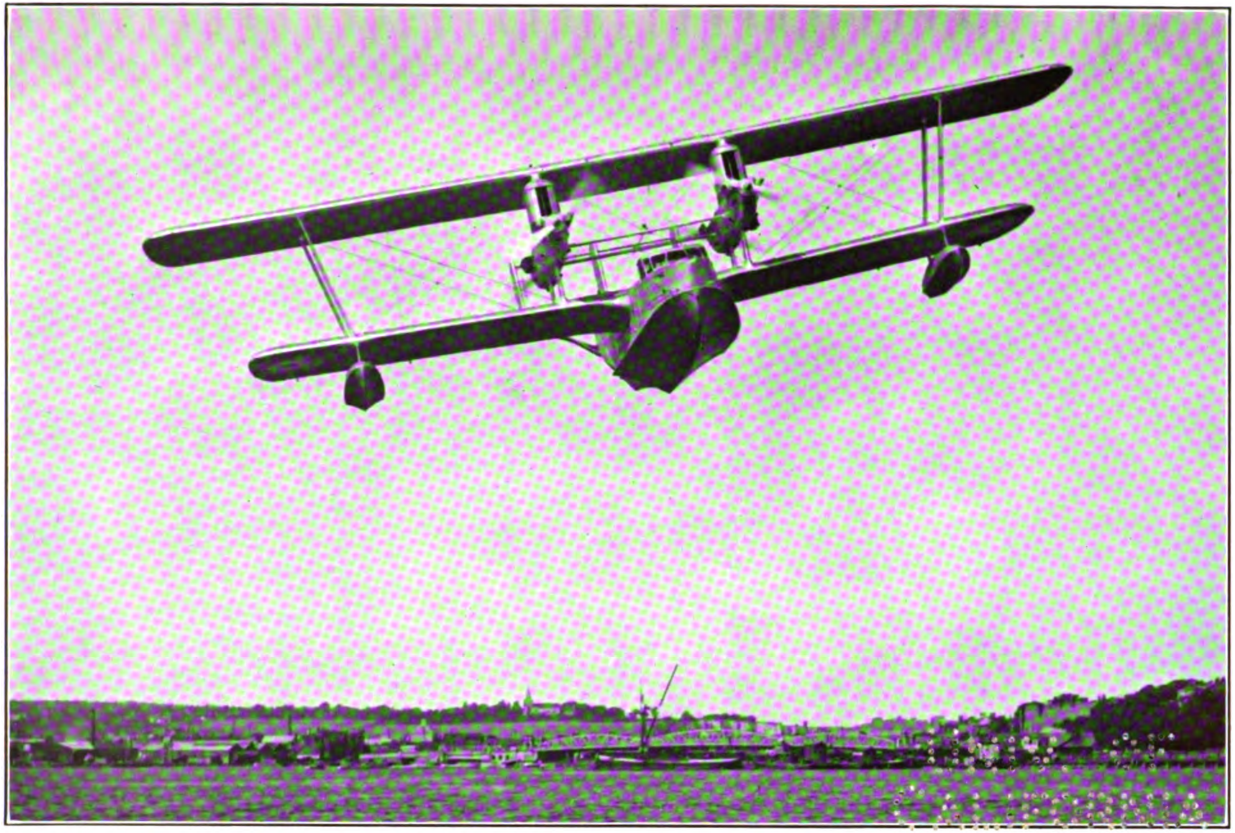
The War over, all attention turned upon higher speeds, passenger carrying, land aerodromes, and, possibly, the attraction of flying over land for peaceful rather than warlike purposes; the flying boat was laid on one side and forgotten. All aviation, in Great Britain at least, was turned over to the new service whose home was on terra firma rather than the sea, and it was natural that what need there might have been for any continuation of its development for use over water had to give way to the claims of progress in more terrestrial directions. This second phase has unfortunately lasted longer in Great Britain than in any other country with equal opportunities, with the result that America, Germany, France, and Italy are all well ahead in what was formerly, and still ought to be, an essentially British field. It is very much to be lamented that with our ample productive facilities, with as good a representation among the world's aircraft designers and engineers as any other country, and with more geographical and commercial justification than most, we should have blindly surrendered our unique position.

ESSENTIAL CHARACTERISTICS OF THE FLYING BOAT.

The characteristic which gives the flying boat its principal advantage over other classes of aeroplane for covering long distances with a useful load is that of the large size to which it can be built. The size of any land aircraft is definitely limited by several factors, of which the most important is the acreage of aerodrome necessary for its take-off. For all practical purposes it may be said that the maximum distance which can be safely flown from point to point by any aeroplane carrying a weight of passengers or mail is proportionate to its own size and cost. In other words, this distance increases with the general dimensions of the aeroplane. Land aeroplanes capable of carrying sufficient fuel for a very long flight require large and therefore expensive aerodromes. To this must be added a sufficient passenger or mail load to make the flight pay. The answer has always hitherto been that for transatlantic purposes the aeroplane would have to be so large, and its take-off so long, that no aerodrome of a practical size would be big enough for its operation. A further, though minor, consideration is that with aeroplanes of such a size the wheels are apt to sink into the ground and hinder the take-off.

When several years ago these limitations were first perceived by designers who wished to cover great distances without a stop, attention was naturally drawn to the fact that lakes and seas provide aerodromes which suffer from no such limitations as are imposed by hills, trees, and houses, and the cost or availability of suitable land. The ship form of hull, moreover, is capable of bearing the full weight of a loaded aircraft on the water, and can even be made to lift as it gathers speed. Until a few years ago it was thought by many to be impossible to build aeroplanes of very large size owing to technical difficulties in their design and construction. The substitution of a hull in place of a normal land undercarriage added considerably to the aerodynamic problems to be faced, and this fact was largely responsible for the delay in flying boat development.

The first big step after the War was made by German designers when they produced that huge boat the Do.X (1928–30), which far outclassed anything that had previously been known. This must be recognised as the first practical attempt to exemplify the new flying boat principle for conquering distance without refuelling. Incidental to this main characteristic, other advantages are gained by the use of flying boats rather than landplanes for long-distance work. Not having aerodrome limitations, the minimum flying speed of a flying boat can be increased; consequently its normal point to point operating speed can be a very high one. True, the hull may be easily damaged when taking off in roughish water at a speed of, say, 70 or 80 knots, and the same will occur if the landing speed is as high as this. But modern devices enable the craft, much lightened at the end of its journey, to alight at a speed which is very considerably below that required for normal flight. It is claimed that the Sikorsky S.42 flying boat with a cruising speed of some 160 miles an hour can land at 65. This boat was brought into general use by Pan-American Airways in 1935. For take-off, should there be a



THE SHORT SINGAPORE III FLYING BOAT.

This Type was to have made the first R.A.F. Visit to Japan, February, 1936, which was abandoned at Shanghai owing to the situation in Tokio.

4 *Rolls-Royce Kestrel Engines.*

necessity for this to be done at a higher speed than is consistent with safety to the hull, a catapult may be used; it is likely that this system will come into general use in the near future for flying where a large petrol load has to be carried.

Again, having practically no dimensional limitations, there seems no reason why the flying boat should not be made large enough not only to cross an ocean, but also to carry numerous passengers and provide them with the extra comfort of ample space for cabins and saloons. Base costs are inevitably reduced. The aerodrome of water costs nothing in upkeep, and it will be far quicker to establish an air base at any suitably sheltered bay or estuary in an undeveloped region than to clear land, drain it, and construct an aerodrome.

In many parts of the world forced landings for the larger types of land aeroplane mean almost certainly that serious damage will be done, if nothing worse, and the probability of being able to fly the aircraft off again, even if repaired, is extremely small. Forced landings for boats, however, may be made on lakes, rivers, harbours, or even the open sea. Quite large flying boats have even been known before now to make a safe landing on terra firma. Such considerations add even further to the list of its advantages, in that by the use of long-range boats all the troublesome and sometimes very costly formalities connected with flying over the territorial limits of foreign countries may often be completely avoided. This point is obviously an important one for commercial aviation.

Finally there is the question of the cost of development of air routes. During the early stages of the growth of any transport service adaptability is a very useful feature for the vehicles used to possess. All the requirements at any particular locality are never accurately known in advance, nor can the best and most economical routes always be anticipated. Changes of route and even of ports of call are inevitable during these stages. Consequently, by the use of the flying boat, operating companies will have the great advantage of being able to make temporary arrangements while trying out a new line of development, without necessarily having to expend large sums of money upon ground aerodrome arrangements or types of aircraft, which it may not eventually be economical to continue using. In actual fact much that is required for the establishment of extensive world air services with flying boats already exists in the shape of shipping facilities. Here lies one respect at least in which Great Britain still enjoys advantages over the rest of the world.

DISADVANTAGES.

The inherent disadvantages of flying boats over land aircraft of similar size are very few, but perhaps the most obvious one is that connected with housing them. When the big *land* mailplane has completed its flight it is wheeled into a large hangar where it is safely housed, and can be cleaned, repaired or overhauled in shelter. Flying boats are not so easily handled or placed under cover. Either large cranes or elaborately equipped slipways are needed, and the result is that, except for special overhauls or docking, the craft must usually remain moored on the open water and exposed to all weathers. Many boats have been lost or damaged from this cause.

Another disadvantage is that connected with the embarkation and disembarkation of passengers, freight, and fuel. In very sheltered harbours flying boats may be got alongside a special pier or jetty, but tides or broken water (even the passing of other water traffic near by) may prevent this, and a journey by boat becomes necessary. From a commercial point of view this is a source of loss of both time and money and adds to operating costs; from the point of view of the passenger it is often regarded as an unpleasant break in an otherwise pleasant journey.

Recent Developments.

The construction of a craft suitable for flying the North Atlantic is now keeping designers busy in every country which hopes to make a bid for the capture of traffic on that very important link in the international system. The Italian squadron of Savoias under the leadership of General Balbo established a notable record by their team flight in several stages from Italy to the North American continent and home again (via the British Isles, Iceland, and Greenland and back via the Azores) in 1933. Since early in 1934 German and French mail planes have flown in regular services across the South Atlantic; and for nearly five years Pan-American Sikorsky boats have covered long distances with clockwork regularity north and south over the Caribbean Sea. Martin Clippers and United States naval flying boats have now completed several flights with standard aircraft from California to Honolulu, and over even greater sea distances. These flights may be said to be passing from the experimental stage. A tentative arrangement (it is understood) has already been reached between Pan-American and Imperial Airways for the conduct of regular services over that most important but difficult route, the North Atlantic crossing, but no attempt to operate any commercial aircraft on that service has yet been put to a practical test. Yet much may be hoped for during the next two or three years.

Trans-South Atlantic Air Services.

Air France started some seven years ago with aircraft as far as Dakar—thence by " aviso," i.e. A/S sloop, to Natal (Pernambuco)—and thence to Buenos Aires by aircraft. Later, Air France ran alternative aircraft services across the South Atlantic every fortnight for experimental purposes. Aircraft did not carry passengers. Air France started their regular all-air service to Buenos Aires in January, 1936. Luft-Hansa started a regular all-air trans-South Atlantic service to Buenos Aires on February 3, 1934.

Pan-American Airways started their South American services in 1929. One service covering the West Coast of South America as far as Valparaiso was commenced towards the end of 1929. The other service, from New York to Buenos Aires, made the first regular flight in July, 1929, but the first *flying boat* used on this service left New York on October 18, 1929. Buenos Aires and Valparaiso were linked by Panagra (the local name for Pan-American Airways) immediately the two services were in full operation. A West Coast of South America service was begun as well as an East Coast one.

The development of commercial air routes is not the sole purpose to which modern flying boats are being put. Besides the different types now being evolved for passenger, mail, and, in a very limited form at present, cargo carrying, craft for naval defence and for general utility purposes of a military nature are also in demand. Moreover, the possibilities of the type for pleasure cruising should not be forgotten.

The Flying Boat as a Naval Aircraft.

The various uses to which aircraft can be put in sea warfare have long been understood by the naval officers of all countries. In the early days of aviation, before flight on and off the deck of a ship became practicable, naval work was carried out exclusively by lighter-than-air aircraft, seaplanes, and flying boats. The last named have proved in the long run to be the best of these types for most classes of non-carrier work. This is principally owing to their ability to cover great distances and remain in the air longest. As all naval air work belongs fundamentally to one of two kinds, seeing (reconnaissance) or striking, it is necessary to examine to what extent the flying boat is capable of carrying it out in either form.

To deal with striking first. As far as flying boats are concerned this is probably their less important rôle. Their load capacity enables them to be armed with a number of the heaviest bombs. But their great size, combined with an inherent lack of manœuvrability, makes them a comparatively easy target for anti-aircraft guns. They are not, therefore, considered very suitable for attacking warships or other defended targets, though they may always, as in the past, prove capable of good work in keeping submarines beneath the surface, and thus of restricting their activities. The larger types of flying boat can be armed with numerous machine guns, and these should enable them to put up an effective defence against attacks by hostile fighters.

For observation duties, however, the flying boat is indeed ideal in many respects. Ample space is available for wireless, for the various instruments for position finding and accurate long-distance navigation over the sea, while an observer can always obtain a good view in any direction he wishes from some position in the craft. Its high endurance makes it suitable for either long-distance sweeps and searches, or for more local patrols of very long duration.

Many occasions can be conceived when flying boats will prove far more convenient and effective for reconnaissance than carrier-borne or other small aircraft. For example, when a raider is reported at any spot where her movements are geographically restricted, the dispatch of one or more flying boats may offer a quicker means of locating and possibly destroying her than the dispatch of carrier aircraft which cannot leave their parent ship until the latter has brought them within their own (shorter) range of the enemy. The carrier can only move at, say, 26 knots or so, and the result may be the loss of many hours before the search is begun.

For providing look-outs to cover the passage of a fleet, however, the distances which aircraft would have to fly from a shore base in order to take up their station ahead of a naval force at sea, and the large numbers normally needed for covering the necessary front, make them less suitable than are carrier aircraft. In the wider oceans, in fact, this duty is totally impracticable for them, and this applies similarly when air forces are needed for searches or sweeps in the open sea. Nevertheless the flying boat has many valuable services to offer the Navy. To those already named may be added the following :—

(1) suitability for establishing a local patrol force at many places which have no aerodrome, without previous preparation being necessary;

(2) ability to reach a given point at a great distance from their base in a very short time;

(3) moral effect of their presence on raiders or submarines;

(4) defensive power which makes them often more suitable than smaller aircraft for operations near an enemy air base.

The day when the flying boat will be able to alight on the open sea and take off again to continue its operations is still far distant. But one should not, for that reason, either suppose that it will never be able to do so, or adjudge it, in its present stage of evolution, as being unfitted to lend a hand in any kind of oceanic work for the Navy.

Evolution of Present-Day Types.

Data tabulated to show the comparative weights, ranges, speeds, and other features of modern flying boats are apt to be misleading, for the simple reason that when obtainable they have rarely been assessed upon the same basis for all. In this short sketch of the subject the task of accurate comparison between the various types of craft constructed to-day is not being attempted. Some interesting conclusions may nevertheless be drawn by taking a glance at the general type characteristics of, and the results which are being achieved by, those built in the countries mainly interested. These countries are, of course, Great Britain, the United States, France, Germany, and Italy.

The most recent notable achievements are those of the United States, whose Martin, Sikorsky, and Consolidated craft have made wonderful records of long distance, carrying capacity and reliability. A naval Consolidated flying boat covered 3,400 miles in about 34½ hours non-stop, during the autumn of 1935. In more pioneering days the Dornier Do.X represented a remarkable forward step in large flying boat construction; while the transoceanic cruise of the 24 Savoias showed the further possibilities of flying boats in regard to North Atlantic work.

British development, having languished under an almost complete suspension for nearly ten years after the War, began to revive with the appearance of the "Southampton," "Calcutta," and "Iris" types of boat between 1927 and 1930. These were all of the multi-engined biplane type, and at that time represented a standard of construction and reliability which was very much on the credit side of the British industry.

Meanwhile, progress abroad in research and design began again to outstrip our own, and further evolution in type, with improvements in performance, thereafter showed itself to be taking place much more rapidly in other countries than in England. The present success of certain foreign designs is coincident with the almost universal adoption of the monoplane type, a form which in conjunction with engine nacelles integral with the wing, appears to give the highest aerodynamic efficiency. One has only to compare the general appearance of such graceful craft with the pagoda-like build of many of their British contemporaries to realise at least one source whence superior speed and efficiency must come.

The factors which now seem likely to militate most heavily against our chances of quickly catching up with foreign competitors are our lack of experience, and the comparatively small scale upon which the British industry has hitherto been organised. But on the other side of the balance we may place the admirable position of our engine producers in the aviation world, and this is no mean advantage. It can be with no little disappointment that the Englishman must remark how his country, the former pioneers of oversea navigation and commercial enterprise, appears to have been unable to maintain its position in this new sphere of endeavour. But it is noteworthy that the countries which have so much to their credit are those in which active government support for aircraft development by private firms, and for the development of the flying boat in particular, has been available on a large scale. Our lack of originality in design, and failure to exploit more fully our national opportunities, must in a large part be due to a weakness in the moral structure upon which the industry in this country depends. No such backwardness has ever been visible in British shipping undertakings, nor in general in the development of road and rail transport.

One is drawn, therefore, to conclude either that the existing system of government control is restricting private enterprise, or that we are suffering from a lack of co-ordination of effort between aircraft designers and the organisations best capable of exploiting our ample world-wide opportunities for establishing oversea air lines.

NON-NAVAL CONTROL.

Our relative lack of progress has also inevitably reacted on the development and application of flying boats for purposes of national defence. But apart from questions of design, are we not here also suffering from a misapplication of control which is liable to keep us in a relatively weak position? Our present constitutional arrangements place all responsibility for Service flying boats in non-naval hands. As has recently been stated in the House of Commons, naval personnel do not operate these craft, even when employed on purely naval duties. It is therefore hardly surprising to observe what a very small part their numbers, their disposition, or their training could enable them to play in the protection of our trade.

To the foregoing considerations may be added the following happier reflections on our prospects for the future. The British Mercantile Marine and shipping organisations constitute a vast ready-made system, in which air transport may before long be beneficially added to that now conducted by passenger and cargo ships. British shipbuilding firms may find themselves in a position to ally themselves with aircraft manufacturers for the construction of flying "ships" of the largest size. Air navigation in flying boats involves much of the teaching and experience already necessary for sea navigation. A familiarity with charts, compasses, courses, winds, chronometers, and many other instruments and methods of calculation; a knowledge of sea and coastal conditions at all times and seasons; experience of harbour work, handling large floating craft in tidal and congested waters; general seamanship; and, last but not least, an age-old tradition of voyaging, discovery, and physical hardihood belong to the sailor, and should also belong to those who would follow this kindred calling.

With the present decline in world trade new openings for shipping companies, for shipyards, and for many of our seafaring men alike should be offered by the future of oversea air transport.

AMPHIBIAN.

REFERENCE SECTION

Comprising

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

TABLES OF COMPARATIVE NAVAL STRENGTH

BRITISH AND FOREIGN AIRCRAFT TYPES

BRITISH AND FOREIGN ORDNANCE TABLES

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PROFILES OF BRITISH AND FOREIGN WARSHIPS

PLANS OF BRITISH AND FOREIGN WARSHIPS

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

LIST OF BRITISH AND FOREIGN SHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.c.	Armoured cruiser.
a.g.b.	Armoured gunboat.
g.b.	Gunboat.
b.	Battleship.
b.c.	Battle-cruiser.
l.cr.	Light cruiser.
c.d.s.	Coast-defence ship.
M.Cr.	Minelaying cruiser.
cr.	Cruiser.
A.A. or H.A.	Anti-aircraft guns.
A.C.	Aircraft carrier.

A.T.	Aircraft tender.
S.C.	Seaplane carrier.
H.N.S.	Harvey nickel steel.
H.S.	Harveyised or similar hard-faced steel.
K.S.	Krupp steel.
t.	Speed and H.P. at trials (in speed and H.P. columns).
b.p. or p.p.	Length of ship between perpendiculars.

L.	Light guns under 15 cwt., including boats' guns.
M.	Machine guns.

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T.	Water-tube boilers, where the type is not known.
B.	Belleville.
Bl.	Blechynden.
B. & W.	Babcock and Wilcox.
D'A.	D'Allest.
My.	Myabara.
Nic.	Niclausse.
Pen.	Penhoet.
T.	Thornycroft.
T.S.	Thornycroft-Schulz.
Y.	Yarrow.

The following abbreviations distinguish types of machinery:—

P.T.	Parsons turbines.
C.T.	Curtis turbines.
B.C.T.	Brown-Curtis turbines.
(G.)	Geared turbines.
tur.	Turbines, where the type is not known.
recip.	Reciprocating engines.
I.C.	Internal combustion engines.

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

GREAT BRITAIN.—Battleships and Battle Cruisers.

Class.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY.§	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Normal Draught.	Horse-Power. Type of Boilers.	Where Built.	Makers of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. Oil.	Complement (War).
												Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft . ins.	ft. ins.						£	in.	in.	in.	in.	in.	in.			knots.	tons	
b	Barham . . . 1935§	31,100	643¾	104 0	31 3	75,000 Y.	Clydeb'nk	J. Brown B.C.T.	1914	1915	2,470,113	13–4	3–1	6	4–2	11	6	8 *15-in.*. 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*; 5 M.; 11 L. 1 catapult, 1 aircraft	2 (sub.) 21″	25‖	— 3425	1126
b.c.	Hood . . . 1941	42,100	860¾	105 3	28 6	144,000	Clydeb'nk	J. Brown . B.C.T. (G.)	1918	1920	5,698,946*	12–6	3–1	7–5	5–4	11	(*a*)	8 *15-in.*, 12 *5·5-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.*; 5 M.; 11 L.	4 a.w. 2 (sub.) 21″	31	— 4600	1341
b.	Malaya¶ . . 1936§	31,100	640¼	104 0	31 3	75,000 B. & W.	Walker .	Wallsend . P.T.	1915	1916	2,945,709	13–6	3-1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 1 *2 pr.*; 5 M.; 11 L.	2 (sub.) 21″	25‖	— 3425	1136
b.	Nelson . . . 1942	33,500	710	106 0	30 0	45,000	N'wc'stle-on-Tyne	Wallsend B.C.T. (G.)	1925	1927	6,410,071*	14	6¼	..	..	16–9	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A.; 4 *3-pr.*, 1 *2-pr.* mult. p.p., 2 *2-pr.*; 5 M.; 11 L.	2 (sub.) 24″	23	— 3900	1360
b.	Queen Elizabeth 1935§	31,100	644¼	‡104 0	31 3	75,000 B. & W.	Portsm'th	Wallsend . P.T.	1913	1915	2,473,103	13–4	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L.	2 (sub.) 21″	25‖	— 3425	1187

b.	**Ramillies** . 1941	29,150	620½	‡102 0	29 0	40,000 Y.	Dalmuir .	Beardmore, P.T.	1916	1917	3,295,810	13–4	4–1	6	6–4	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L. (Resolution 5 *4-in.* A.A.)	2 (sub.) 21″	23‖	— 3230	1010
b.	**Resolution** 1937		620¼	‡101 4			Jarrow .	Palmer P.T.	1915	1916	2,449,680											1012
b.	**Revenge** . 1937		625¾	‡101 5			Barrow .	Vickers P.T.	1915	1916	2,406,368											1104
b.	**Royal Oak** 1938		620½	‡102 1			Devonp'rt	Hawthorn P.T.	1914	1916	2,468,269											1149
b.	**Royal Sovereign** 1936§		620¾	‡101 6			Portsm'th	Parsons P.T.	1915	1916	2,570,504											1104
b.c.	**Renown** . 1940	32,000	794¼	102 4	25 6	112,000 B. & W.	Govan .	Fairfield B.C.T.	1916	1916	3,117,204	9–3 K.C.	2	6–3	4–3	11–7 K.C.	6 K.C.	6 *15-in*, 15 *4-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L.; catapult and 1 aircraft in Renown	2† (sub.) 21″	31·5‖	— 4300	1188
b.c.	**Repulse** . 1939			102 6			Clydeb'nk	J. Brown . B.C.T.	1916	1916	2,829,087											1209
b.	**Rodney** . 1942	33,900	710	106 1	30 0	45,000	Birkenh'd	Cammell Laird B.C.T. (G.)	1925	1927	6,414,653*	14	6¼	..	..	16	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in* A.A; 4 *3-pr.*; 6 *2-pr.*; 5 M; 11 L.	2 (sub.) 24″	23	— 4000	1315
b.	**Valiant** . 1939	31,100	639¾	104 ‡ 0	31 3	75,000 B. & W.	Govan .	Fairfield . B.C.T.	1914	1916	2,537,037*	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L., 1 aircraft	2 (sub.) 21″	25‖	— 3425	1136
b.	**Warspite** . 1935§	31,100	644½	104 ‡ 0	31 3	75,000 Y.	Devonp'rt	Hawthorn P.T.	1913	1915	2,518,360*	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L.	2 (sub.) 21″	25‖	3425	1130

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* Total estimated cost of ship including guns.

† Repulse has 8 a.w. tubes in addition.

‡ Over rubbers.

¶ Built at the charge of the Federated Malay States.

§ The London Naval Treaty (1930) suspended replacement of capital ships during the years 1931-36 inclusive.

‖ Speed without bulges.

(*a*) Guns are in shields of 1-in. H.T. plating.

GREAT BRITAIN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Extreme breadth under water over rubbers.		Draught.		Horse-Power. Type of Boiler.	Where Built.	Maker of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Coal. / Oil.	Complement (War).
														Belt. / Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ins.	ft.	ins.						£	in.	in.			knots.	tons.	
A.C.	Ark Royal	22,000	..	..		..		..	Cammell Laird	..	Bldg.	..	..	..	..	4·5 *in.* guns	—	..	..	..
A.C.	Argus	14,450	567	75	9	21	0	20,000	Dalmuir	Beardmore P.T.	1917	1918	Purchased under construction	..	..	6 4-*in.* A.A., 4 3-*pr.* 4 M., 10 L., accommodates 20 aircraft	—	20·2	— / 2000	420
S.C.	Pegasus* (late Ark Royal)	6,900	366	50	10	17	6	3000	Blyth	Blyth S. B. Co. recip.	1914	1914	do.	..	..	4 M., 10 L.	—	11	— / 500	139
A.C.	Courageous	22,500	786¼	90 over rubbers	6	22	3	90,000 Y.	Walker† (Armstr'g)	Parsons P.T.(G.)	1916 As cruisers.	1928 As aircraft carriers.	1,785,940 (*a*) 2,115,944 (*b*)	3	9–7	16 4·7-*in.*, 4 3-*pr.*, 4 2-*pr.* Pom Poms, 4 M., 42 L.	—	30½	— / 4070	770
A.C.	Glorious								Belfast†	Harland & Wolff P.T.(G.)		1930	2,119,066 (*a*) 2,137,374 (*b*)	3	9–7				— / 3980	
A.C.	Eagle, *ex*-Almirante Cochrane.	22,600	667½	105	2	21	11	50,000 Y.	Walker (Armstrong)	J. Brown B C.T.	1918 As a battleship.	1924 As an aircraft carrier.	4,211,576	.	..	9 6-*in.*, 4 4-*in.* A.A., 4 3-*pr.*, 2 2-*pr.* Pom Poms, 32 smaller, 20 aircraft	—	24	— / 3775	753
A.C.	Furious	22,450	786½	90§	1	21	6	90,000 Y.	Walker (Armstrong)	Wallsend Engn'g Co. B.C.T.(G.)	1916 As a cruiser.	1925 As an aircraft carrier.	2,436,603	3 / —	7	10 5·5-*in.*, 3 4-*in.* A.A., 4 3-*pr.*, 4 2-*pr.* Pom Poms, 46 smaller, 30 aircraft	—	31	— / 4010	728
A C.	Hermes	10,850	600	70	3	18	7	40,000	Elswick	Parsons Co. P.T.(G.)	1919	1924	2,030,263‡	..	..	6 5·5-*in.*, 3 4-*in.* A.A., 4 3-*pr.*, 2 2-*pr.* Pom Poms, 4 M., 16 L., 15 aircraft	—	25	— / 2000	551

* Used for experimental work.

(*a*) First cost of ship as a cruiser.

† Reconstructed as aircraft carriers at Devonport dockyard.

(*b*) Estimated cost of reconstruction as an aircraft carrier.

‡ Estimated cost including guns.

§ Over rubbers; 120 ft. over pallisades.

1 aircraft carrier is included in the 1934 programme, to be built by contract.

GREAT BRITAIN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Types of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	tons.	
South-ampton Class	Southampton	9 000	584	61 8	17 0	7,500	J. Brown	Scotts	Bldg.	..	..	..	..	12 6-*in.*, 8 4-*in.*, 2 smaller, 1 catapult	6	32	..	..
	Newcastle						Vickers, (Tyne)											
	Glasgow		on W.L.				Scotts											
	Sheffield						Vickers, Tyne											
	Birmingham						Devonp'rt							6-*in.* guns	..	..	..	..
	Liverpool						Fairplay											
	Manchester						H'wthorn											
	*Gloucester						Devonp'rt											
Arethusa Class	Galatea	5,200	506	51 0	13 10	64,000	(Scott) Greenock	Scott	1934	1935	..	..	..	6 6-*in.* guns, 4 4-*in.* A.A., 18 smaller, 1 catapult, 1 aircraft	2 T. 21″	32¼	1200	..
	Arethusa						Chatham	Parsons										
	Penelope						Harland & Wolff	Harland & Wolff	1934	1935								
	Aurora						Portsm'th	Wallsend	1935	est. 1936								
Leander Class	Ajax	7,000	554½ o.a., 522 b.p.	55 8	16 0	72,000 P.T. (G.)	Barrow	Vickers	Bldg.	1935	..	..	..	8 6-*in.*, 4 4-*in.* A.A., 4 3-*pdr.* guns, 5 M.G., 12 smaller, 1 floatplane	2 Q. 21″	32½	— 1800	570
	Achilles	7,030					Birken-head	Cammell Laird	1932	1933								
	Neptune	7,000					Portsm'th	Parsons	1933	1934	1,560,414	..	..					
	Orion	7,070					Devon-port	Vickers-Armstrongs	1932	1934	1,548,663	..	..					
	Leander	7,140	..	55 2	..	..	Devonp'rt	Vickers-Armstrongs	1931	1933	1,667,819	..	..					
*Modified Leander Class	Amphion	7,000	560	56 8	15 8	72,000	Portsm'th	Beardmore	1934	est. 1936	..	..	..	8 6-*in.*, 4 4-*in.*, 21 smaller, 1 catapult, 2 aircraft	..	32½	1800	..
	Apollo						Devon-port	Beardmore	1934	1936								

* Not yet ordered.

GREAT BRITAIN.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)		Draught.		Horse-Power. Type of Machinery and Boilers	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost	Armour. Belt. / Deck.	Armour. Gun Position	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement (War).
		tons.	ft.	ft.	ins.	ft.	ins.						£	in.	in.			knots.	tons.	
M. Cr.	Adventure	6.800	539	59	0	14	5	40,000 tur. and Diesel	Devonp'rt	Vickers	1924	1927	1,246,083	..	..	4 *4·7-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms; 2 M., 8 L. 310 mines	—	27¾	— / 1520	395
Kent Class	Berwick	9,750	630	68	4	16	3	80,000 (G.) Y.	Govan	Fairfield	1926	1928	2,029,526	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft	2 Q. 21″	31½	— / 3200	700
	Cornwall								Devonp'rt	Beardmore	1926	1928	1,252,110*	..	..					
	Cumberland								Barrow	Vickers	1926	1928	2,960,821*	..	..					
Carlisle Class.	Cairo	4200	451¾	43	10	14	1	40,000 (G.) Y.	Birken-head	Cammell Laird	1918	1919	787,479	3 / —	..	5 *6-in.*, 2 *3-in* A.A., 4 *3-pr.* 2 *2-pr.* Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	— / 950	415
	Calcutta								Barrow	Vickers	1918	1919	832,123							
	Capetown								Birken-head	Cammell Laird	1919	1922	1,984,720							
	Carlisle								Govan	Fairfield	1918	1918	669,216							
	Colombo								Govan	Fairfield	1918	1919	692,308							
Caledon Class	Caledon	4180	450 –450¼	43	1	14	1	40,000 P.T. (G.) Y.	Birken-head	Cammell Laird	1916	1917	547,300	3 / —	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	— / 935	420
	Calypso								Newcastle (Hawth'n)	Hawthorn Leslie	1917		529,190							
	Caradoc								Green'ck	Scotts'	1916		534,583							
Cambrian Class	Castor	3920	446¾ –447	41	9	13	6	40,000 tur.	Birken-head	Cammell Laird	1915	1915	358,300	3 / —	..	4 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.*, Pom Poms; 1 M.; 8 L. [Champion 1 *3-in.* A.A., and no *3-pr.*]	2 (sub.) 21″	29	— / 841	360
	Constance								Birken-head	Cammell Laird	1915	1916	374,270							

* Total estimated cost of ship, including guns.

Ceres Class	**Cardiff** .	4290	450 –450⅓	43	9	14	1	40,000 (G.) Y.	Govan .	Fairfield .	1917	1917	542,507	3 —	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms; 2 M., 8 L. [Cardiff, Ceres, Curacoa } 2 *3-pr.*]	8 a.w. 21″ (D.)	29	— 950	430
	Ceres .								Clydebank	J. Brown .	1917	1917	529,248							
	Coventry .								Newcastle (Swan Hunter)	Swan Hunter	1917	1918	586,182							
	Curacoa .								Pembroke	Harland & Wolff	1917	1918	794,201							
	Curlew .								Barrow .	Vickers .	1917	1917	514,436							
D Class	**Despatch** .	4850	471¼ –472¾	46 –46	3 9	14	3	40,000 (G.) Y.	Govan .	Fairfield .	1919	1922	1,016,870	3 —	Shields	6 *6-in.*, 3 *4-in.* A.A., 2 M., 4 *3-pr.*, 8 L., 2 *2-pr.* Pom Poms.	12 a.w. 21″ (T.)	29	— 1060	460
	Danaë .								Elswick	Armstrong	1918	1918	701,600							
	Dauntless .								Jarrow	Palmer .	1918	1918	750,025							
	Dragon .								Green'ck	Scotts' .	1917	1918	690,083							
	Delhi .								Elswick	Armstrong	1918	1919	785,145							
	Durban .								Green'ck	Scott .	1919	1921	954,667							
London Class	**Devonshire** .	9750	630	66	0	17	0	80,000 P.T. (G.) Y.	Devonp'rt	Vickers	1927	1929	2,007,275	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft.	8 a.w. 21″ (Q.)	32¼	— 3200	700
Norfolk Class	**Dorsetshire** .	9900	633	66	0	17	0	80,000 (G.)	Portsmouth	Cammell Laird	1929	1930	2,101,951	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 6 M., 8 L, 1 aircraft.	8 21″ (Q.)	32¼	— 3200	710

GREAT BRITAIN.—Cruisers, &c.—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	tons.	
Improved Birmingham Class	Effingham	9770	605	65 2	17 3	65,000 (G.) Y.	Portsmouth	Harland & Wolff	1921	1925	2,138,999	3 —		7 7·5-*in.*, 3 4-*in.* A.A., 4 3-*pr.*, 2 2-*pr.*, 2 M., 8 L.	4 a.w. 1 sub.	30½	— 2170	713
	Frobisher ‡	9860		65 1			Devonport	Wallsend Eng. Co.	1920	1924	2,035,915†		Shields	6 7·5-*in.*, 2 4-*in.* A.A., 4 3.-*pr.*, 2 M., 8 L.	2 sub.	30½		715
E Class	Enterprise	7580	570	54 9	16 6	80,000 B.C. (G.) Y.	Clydebank	John Brown	1919	1926	1,690,658*	3–1½ 1	..	7 6-*in.*, 3 4-*in.* A.A., 4 3-*pr.*, 2 2-*pr.* Pom Poms, 2 M., 8 L., 1 aircraft.	16 21″ (Q.)	33	— 1750	577
	Emerald	7550		54 7			Elswick	Armstrong	1920	1926	1,617,120							
York Class	Exeter	8390	575	58 0	17 0	80,000 (G.) Y.	Devonp'rt	Parsons	1929	1931	1,837,415*	..	..	6 8-*in.*, 4 4-*in.* A.A., 4 3-*pr.*, 6 M., 8 L., 2 aircraft.	6 21″	32	— 1900	630
Improved Birmingham Class	Hawkins	9800	605	65 1	17 3	55,000 (G.) Y.	Chatham	Parsons Co.	1917	1919	1,599,741	3 —	Shields	7 7·5-*in.*, 4 4-*in.* A.A., 4 3-*pr.*, 2 2-*pr.* Pom Poms; 2 M., 8 L.	4 a.w. 2 sub.	29½	— 2680	747
Kent Class	Kent	9850	630	68 5	16 8	80,000 (G.) Y.	Chatham	Hawthorn Leslie	1926	1928	2,084,213†	..	..	8 8-*in.*, 4 4-*in.* A.A., 4 3-*pr.*, 4 2-*pr.* Pom Poms; 4 M., 8 L., 1 aircraft.	8 21″ (Q.)	31½	— 3200	685
London Class	London	9750	630	66 0	17 0	80,000 P.T. (G.)	Portsmouth	Fairfield	1927	1929	2,029,949*	..	..			32¼	— 3200	685
Norfolk Class	Norfolk	9850	633	66 0	17 0	80,000 (G.)	Fairfield	Fairfield	1928	1930	2,141,961*	..	..	8 8-*in.*, 4 4-*in.* A.A., 4 3-*pr*, 4 2-*pr.* Pom Poms, 4 M., 8 L., 1 aircraft.	8 21″ (Q.)	32¼	— 3200	685

London Class	Shropshire . .	9730	633	66	0	17	0	80,000 (G)	Dalmuir .	Beardmore	1928	1929	1,941,950†	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L, 1 aircraft	8 21″ a.w. (Q.)	32¼	$\frac{-}{3200}$	685
	Sussex . .	9730	633	66	0	17	0	80,000 (G.)	Hawthorn Leslie .	Hawthorn Leslie .	1928	1929	1,975,800†	..	..					
Kent Class.	Suffolk .	9800	630	68	5	16	3	80,000 (G.)	Portsmouth	Parsons .	1926	1928	2,180,240†	..	..			31½	$\frac{-}{3200}$	685
Improved Birmingham Class . .	Vindictive .	9996	605	65	2	17	3	60,000 (G.) Y.	Belfast	Harland & Wolff .	1918	1918	1,671,712	$\frac{3}{-}$	Shields	6 *7·5-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	4 a.w. 2 sub. 21″	30	$\frac{800}{1420}$	720
York Class.	York . .	8250	575	57	0	17	0	80,000 P.T. (G.) Y.	Palmers'	Palmers' .	1928	1930	1,774,276	..	..	6 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft	6 21″ (T.)	32¼	$\frac{-}{1900}$	623

* Total estimated cost of ship, including guns. † Estimated cost, excluding armament and ordnance stores. ‡ Now employed as Cadets' Seagoing Training Ship.

Patrol Boats.—P.C. 74, 610 tons, 20 knots, 1 4-in.; Dart (1918), 610 tons, 20 knots, 1 4-in., 2 12-pr.; P.59 (1917), P.40 (1916), Spey (1917), 560 tons, 20 knots, 1 4-in., 1 2-pr.

Training Ships and Gunnery Drill Ships (ex-Monitors).—Erebus, 7,200 tons; Terror, 7,200 tons; Marshal Soult, 6,400 tons.

Fishery Protection Gunboats (ex-trawlers).—Colne, Doon, Dee, Eden, Foyle, Garry, Kennet, Liffey, 490–550 tons, 11 knots, reciprocating machinery, 1 12-pr.

Destroyer Depôt Ships.—Greenwich (1916), 8,100 tons; Sandhurst (converted 1916), 11,500 tons; Woolwich (1935), 8750 tons, 15 knots, 4 4-in. A.A.

Submarine Depôt Ships.—Lucia, 5,800 tons; Titania, 5,250 tons; Alecto, 935 tons; Dolphin, 4530 tons; Cyclops, 11,300 tons; Medway (Vickers', 1929), displacement 14,650 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A. Maidstone, included in 1935 programme to be built by contract.

Repair Ships.—Assistance (1903), 9,600 tons; Resource (Vickers', 1930), displacement 12,300 tons, speed 15 knots, armament 4 4-in. A.A.

Minelayers (ex-Monitors), 1915.—Medea, 540 tons, 12 knots, 44 mines; Medusa, Melpomene, Minerva, 355 tons, 10 knots, 52 mines; (ex-trawlers) Vernon, 430 tons; Kate Lewis, 308 tons, 24 mines.

Surveying Vessels.—Beaufort, Fitzroy, Flinders, and Kellett, 800 tons, 16 knots, 1 3-pr.; Herald, Ormonde, and Iroquois, 1,650 tons, 15½ knots, 1 3-pr.; Endeavour, 1280 tons, 13 knots, 1 3-pr.; Challenger (Chatham, 1931—originally intended as a fishery investigation vessel), 11,40 tons, 1,200 H.P. (recip.), 12½ knots.

Non-magnetic Survey Vessel.—Research, included in 1935 programme, to be laid down in 1936, by contract.

Netlayer and Target Towing Vessel.—Guardian (Chatham, 1931–3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A. Protector (1934 programme), 2900 tons, building at Messrs. Yarrow.

Mining School (Vernon) Tender.—Nightingale (Portsmouth, 1931), Skylark (Portsmouth, 1932), displacement 275 tons, horse-power 400, speed 10 knots, coal capacity 15 tons.

Boom Defence Vessels.—Moorgate (Bow, McLachlan 1931), 345 tons, 1 4-in. gun; Bishopsgate (Henry Robb, 1932) and Aldgate (1934); Watergate (1934), 290 tons. 3 boom vessels included in 1934 programme.

Tenders.—(For Submarine depot, Portland), Elfin (1933), 222 tons, 250 H.P., 9¼ knots. (For Torpedo School) Redwing (1933), 225 tons, 250 H.P., 9½ knots.

Gunnery Training Ship.—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Gunnery Training Ship (1931–32).

Fleet Target Ship.—Centurion (ex-battleship), 25,500 tons.

Auxiliaries.—Tugs, Trawlers, Drifters, Hospital Ship (Maine, 10,100 tons), Oilers, Store ships, etc,

For sloops, minesweepers and river gunboats, see Flotilla tables, pp. 246–8.

Defence Forces of the Dominions.

ROYAL AUSTRALIAN NAVY.

Under Control of the Australian Naval Board.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Coal. / Oil	Complement (War).
														Belt. / Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	in.	ft.	in.						£	in.	in.			knots	tons.	
Kent Class Cruisers	Australia . .	9870	630	68	4	16	3	80,000 B.C. (G.) Y.	Brown Clyde-bank	Brown	1927	1928	..	..	..	8 *8-in.*, 4 *4-in.* A A., 4 *3-pr.*, 4 *2-pr.* Pom Pom, 4 M., 12 L.	8 21″ a.w. (Q.)	31½	— 3200	685
	Canberra . .	9850																		
Amphion Class	Sydney . .	7000	530 b.p.	56	8	15	8		Wallsend	Wallsend	1934	1935				8 *6-in.*, 4 *4-in.* A A.. 21 smaller, 1 catapult, 1 aircraft	2 Q. 21″	32½		
Adelaide Type Cruiser	Adelaide .	5100	462½	50	1	15	10	25,000 P.T. Y.	Sydney	Sydney	1918	1922	..	3 —	..	9 *6-in.*, 1 *3-in.* A.A., 4 *3-pr.*, 10 L., 2 M.	2 (sub.) 21″	25·5	951 558	450
Chatham Type Cruiser	Brisbane *. .	5120	457	49	10	15	9	25,000 P.T. Y.	Sydney	Vickers T.	1915	1916	..	3 —	..	8 *6-in.*, 1 *3-in.* A.A., 4 *3-pr.*, 10 L., 2 M.	2 (sub.) 21″	25·5	1196 260	490
Seaplane Carrier	Albatross . .	4800	443¾	61	0	15	6	12,000 P.T. (G)	Cockatoo Island	Sydney	1928	1929	—	—	—	4 *4·7-in.* A.A., 4 *2-pr.* Pom Pom, 4 *3-pr.* 4 M., 20 L., 9 seaplanes	—	21	— 1000	350
Flotilla Leader	Stuart .	1530	332½	31	9	12	3	40,000	Hebburn	Hawthorn Leslie	1918	1918	—	—	—	5 *4·7-in.*, 1 *3-in.* A.A., 7 M. & L.	6†	36½	500 Oil	182

DESTROYERS.—"*V*" *Class* :—Vampire, Vendetta, Voyager, Waterhen. Completed, 1917–18; Displacement, 1,090 tons; 27,000 H.P.; speed, 34 knots; armament, four 4-in.; 6 smaller guns, 6 torpedo tubes.

"*S*" *Class* :—Stalwart, Success, Swordsman, Tasmania, Tattoo. Completed, 1919; Displacement, 905 tons; 27,000 H.P.; speed, 36 knots; armament, three 4-in., one 2-pdr., 2 double 21″ torpedo tubes.

SLOOPS.—Yarra (1935), 1060 tons, 2000 H.P. (T.G.), 16½ knots, 3 4-in., 13 smaller guns, and Swan, a repeat vessel, building.

SURVEYING VESSEL: Moresby (late Silvio) (1918), 1650 tons, length 267½ ft., 2,500 H.P., 15 knots, one 3-pr.

DEPÔT AND FLEET REPAIR SHIP: Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 3,455 tons, 14 knots, 1 4-in.

* Due to be prepared for sale. † Torpedo tubes are removed in "Stuart."

NEW ZEALAND NAVY.

Under the control of New Zealand Naval Board.

Light Cruisers—"*D*" *Class*:—Dunedin; completed, 1919 (Elswick). Diomede; completed 1922 (Vickers). Displacement, 4,850 tons; 40,000 H.P.; speed, 29 knots; armament, 6 6-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 4 triple 21-in torpedo tubes; max. fuel, 1,060 tons oil; complement, 450.

Training and Depot Ship.—Philomel (2570 tons). **Trawler.**—Wakakura.

The **Sloops** Leith and Wellington (see page 265) are allocated to the station.

ROYAL CANADIAN NAVY.

Under control of the Canadian Department of National Defence.

Destroyers.—Champlain (ex-Torbay) and Vancouver (ex-Toreador). Completed, 1919 (Thornycroft). Displacement, 905 tons; 29,000 H.P.; speed, 36 knots; armament, 3 4-in., 1 2-pr., 2 double 21-in. torpedo tubes; oil, 305 tons (radius of action, 3,500 at 15 knots). Saguenay and Skeena completed at Thornycroft's in 1931; displacement, 1337 tons; 32,000 H.P.; speed, 35 knots; armament, 4 4·7-in., 2 2-pr., 2 quad. 21-in. torpedo tubes; oil, 440 tons.

Depot Ships.—Naden and Stadacona. **Minesweeping Trawlers.**—Festubert, Ypres, and Armentieres (1918), 360 tons.

SOUTH AFRICA.

[The seagoing force of the South African Naval Service was disbanded in 1934.]

ROYAL INDIAN NAVY.

Minesweeping Sloops.—Indus (1935, Hawthorn Leslie), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4.7-in., 15 smaller guns. Hindustan (1930, Swan Hunter), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4-in., 14 smaller guns. Clive, 2,021 tons; 1,700 H.P.; 14½ knots; 2 4-in., 2 2-pdr., 4 3-pdr. guns; completed Beardmore, 1920. Lawrence, 1,259 tons; 1,900 H.P.; 15 knots; 2 4-in., 4 3-pdr., 2 2-pdr. guns; launched Beardmore, 1919.

Sloops.—Cornwallis, 1,350 tons; 16½ knots; 2,500 H.P.; 3 4-in., 2 2-pdr., 4 3-pdr. guns (launched Hamilton, 1917, as the Lychnis).

Surveying Ships.—Investigator (Vickers, 1907), 1,172 tons; 1,550 H.P.; 13 knots; no guns.

Patrol Boats.—Pathan (ex-P.C. 69), 695 tons; 3,500 H.P., 20 knots, and 1 4-in. and 2 12-pdr. guns; completed 1918.

Depot Ship.—Dalhousie (1886), 1960 tons; 4 3-pdr. guns.

ARGENTINE REPUBLIC.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Second-ary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.	**Almirante Brown**	6495	545¾	58	16¼	85.000 Y. (G.)	Leghorn .	1929	1931	1,250,000	..	1″	..	..	..	..	6 *7·5-in.*, 12 *4-in.* A.A., 6 Pom Poms, 1 catapult, 2 seaplanes.	6 21″ (T.)	32	— / 1660	600
c.	**Vinticinco de Mayo**						Genoa . .														
c.d.s.	**General Belgrano**†	6100	328	59¾	24	13,000	Leghorn .	1897	1899	696,700	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 10 *6-in.*, 6 *4·7-in.*, 4 *6-pr.*	—	20	oil	515
c.d.s.	**General San Martin**†	6100	328	59¾	24	13,000	Leghorn .	1896	1898	688,200	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	4 *8-in.*, 6 *4·7-in.*	—	20	oil	431
c.d.s.	**Pueyrredon** † .	6100	328	59¾	24	13,000	Sestri Ponente	1898	1901	782,000	6–3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *6-in.*, 4 *6-pr.*, 1 *1-pr.* A.A.	—	20	oil	430
b.	**Moreno** . .	27,720	585	97¾	28	45.000* (G.)	Camden, N.J. (N.Y.S.B.Co.)	1911	1915	2,200,000	12–10 K.S.	3–2	9–6 K.S.	9 K.S.	12–9 K.S.	6 K.S.	12 *12-in.*, 12 *6-in.*, 4 *3-pr.*, 6 M., 4 L.	2 (sub.) 21″	22·5	— / 4200	1200
	Rivadavia .						Quincy, Mass.		1914												940

Training Cruiser building at Vickers, Barrow, 7,800 tons, 30 knots, nine 6-in., four 4-in. A.A., eight 2-pr. A.A., six 21-in torpedo tubes to be fitted with 1 catapult and 2 aircraft, order placed 1935; to replace Presidente Sarmiento.

The old coast-defence ironclads Libertad and Independencia, 2595 tons, completed at Birkenhead in 1891–93, and converted to oil fuel in 1927, carry two 9·4-in., four 4·7-in., and four 3-pr. guns. The Libertad is used as parent ship for submarines.

River gunboats Paraná and Rosario (Elswick, 1908), 1055 tons, two 6-in. howitzers, six 3-in., 2 L., 15 knots.

The training-ship (cruiser) (Birkenhead, 1896; refitted 1926), Presidente Sarmiento, 2320 tons, 15 knots; four 4·7-in., four 6-pr., two 3-pr.

Sloops (surveying vessels), San Juan and San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1—3-in, 12 knots. Alferez Mackinlay (1914), 783 tons, 10 knots.

Tugs, Mataco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914), and 12 others.

Nine Minesweepers (ex-German), seven transport and other auxiliaries.

One cruiser, three sloops, two transports and four coastguard vessels are projected.

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* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928.

† {Converted to oil burning and armament altered in 1929.
Used as training ships.

BRAZIL.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkheads.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.d.s.	**Floriano**	3162	267½ p.p.	48	13¼	3400	La Seyne .	1897	1901	..	13¾–4 H.S.	1½	..	..	8 H.S.	3 H.S.	2 *9·4-in.*, 4 *4·7-in.*, 2 M., 4 *6-pr.*; 2 L.	—	15·0	246 / —	260
b.	**Minas Geraes** *	19,200	541	83	25	25,000 t B.&W.	Elswick .	1909	1910	1,821,400	9–6–4 K.S.	2	9–6–4 K.S.	9	12–8 K.S.	9 K.S.	12 *12-in.*, 16 *4·7 in.*, 4 *3-in.* A.A.; 4 A.A. M.G.	—	21	2360 / 350	850
b.	**São Paulo**						Barrow .	1908	1910								12 *12-in.*, 12 *4·7-in.*, 6 *3-pr.*, 2 *3-in.* A.A.; 4 M.				
cr.	†**Bahia** . .	3100	401½	39	13½	22,000 B.C.T. (G.) Th.	Elswick .	1909	1910	..	..	..	..	..	..	..	10 *4·7-in.*, 4 *3-pr.*	4 21″ (D)	27	Oil	450
cr.	†**Rio Grande do Sul** . .																				

* Fitted with new oil-burning water-tube boilers by Thornycrofts, 1935.

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

RIVER GUNBOATS.—Missões (1904), 200 tons, 11 knots, one 15 pr., one 6 pr.; Oyapock, 195 tons, 14 knots, one 3 pr..

GUNBOATS.—Almirante Bastos dos Reis and Almirante Brasil; ordered in 1931.

MINELAYERS.—Maria do Couto, Carneiro da Cunha, Heitor Perdigao and Muniz Freire.

RIVER MONITOR.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910).

GUNBOAT SCOUT.—Victoria (ex-Espirito Santo), 470 tons, two 4·7-in., two 3-pr., 11 knots.

SUBMARINE TENDER.—Ceará (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in. guns.

ARMED TRANSPORT.—Belmont (ex-German SS. Valesia), 5227 tons gross, four 4·7-in, six 6-pr.

TRAINING SHIP.—Saldanha Dagama, Vickers' (1934). A four-masted schooner, 3325 tons, 262 feet in length, four 4-in. and one 3-in. A.A. guns.

The approved building programme includes two cruisers of 8,500 tons, to be completed in 8 years. Orders have not yet been placed.

CHILE.—Armoured Ships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Second-ary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal.	Fuel. Oil.	Complement.
		tons.	ft.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.		
b.	**Almirante Latorre** * (ex-H.M.S. Canada)	28,950	661	92 6	29 0	37,000 P.T. Y.	Elswick	1913	1915	..	9–4	4–2½	4½	..	10	6	10 *14-in.*, 14 *6-in.*, 2 *3-in.*, A.A., 4 *3-pr.*, 1 catapult.	4 (sub.) 21″	23		Oil.	1000
a.c.	**General O'Higgins**	6,977	412 p.p.	62 9	22 0	16,000 B.	Elswick	1897	1898	..	7–5	2	..	..	7½–6	6	4 *8-in.*, 10 *6-in.*, 12 *3-in.*, 4 M.	—	21·5 *t*	1200	—	500
b.	**Capitan Prat** †	5,416	328 p.p.	60 9	22 9	12,000	La Seyne	1890	1893	391,000	12	3	4	..	10½	2	4 *9·4-in.* (Canet), 8 *4·7-in.* (Canet), 8 *6-pr.*, 11 M.	2 18″	18	775	—	500

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931). † Submarine parent ship.

Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Coal.	Complement.
		tons.	ft.	ft. ins.	ft. ins.						in.	in.			knots.	tons.	
cr.	**Blanco Encalada**	3435	370 p.p.	46 6	19 6	14,500	Elswick	1893	1894	..	4–1½	..	2 *8-in.*, 8 *6-in.*, 4 *3-in.*	—	22·78 *t*	850 —	385
,,	**Chacabuco**	3417	360 p.p.	46 6	17 0	15,500	Elswick	1901	1903	..	4½–1½	..	2 *6-in.*, 10 *4·7-in.*, 4 *3-in.*	—	24·0	1000 —	400

Oilers (Armstrongs, 1930): Maipo, 4,686 tons gross; Rancagua, 3,080 tons displacement, two 4·7-in. guns. Coastguard Vessels: Orompello, Leucoton, Elicura, Colocolo, 530 tons; Aguila, 820 tons; Porvenir, 450 tons. Sibald, Yelcho, Micalvi, Condor, and Yanez. Submarine Depot Ship: Araucano (Vickers-Armstrongs, Barrow), completed 1930; displacement 5,890 tons; armament two 4·7-in.; length b.p. 390 ft.; beam 55 ft.; draught 16 ft. 6 ins.; speed 18 knots; H.P. 2,500.

Training Ship.—General Baquedano (1898), 2350 tons, four 4-in. guns, two 3-pr. Two tugs. Two towing launches.

DENMARK.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed	Fuel.		Complement.
														Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns	Torpedo Tubes.		Coal.	Oil.	
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.		
a.c.	**Niels Juel**	3400	295	4	53	6	15	9	5500	Copenhagen	1918	1923	..	8–4 K.S.	2	..	..	..	2 K.S.	10 *5·9-in.*, 2 *3-pr.*, 4 *6-pr.* A.A.	2 (sub.) 18″	17·0	240	250	309
o.d.s.	**Olfert Fischer**	3415	283	9	50	6	16	9	4600 *t*	Copenhagen	1903	1905	..	7–4	3	..	..	7	6	2 *9·4-in.*, 4 *5·9-in.*, 6 *3-in.*, 2 *6-pr.* A.A., 2 *1-pr.*, 2 M.	3 (sub.) 18″	16·0	250	—	256
o.d.s.	**Peder Skram**	3515	286	7	51	6	16	3	5400	Copenhagen	1908	1909	..	8–4 K.S.	2	..	..	7 K.S.	6 K.S.	2 *9·4-in.*, 4 *5·9-in.*, 8 *3-in.*, 2 *1-pr.*, 2 *3-in.* A.A., 2 M.	4 (sub.) 18″	16·0	250	—	262

Mine-layers: Lossen, 600 tons, 12 knots, 175 mines; Minekran v and vi, 186 tons, 8 knots, 60 mines; Mining boats 1–10. Groensund, torpedo boat repair ship (Diesel-electric drive); Hekla, submarine depôt ship. Submarine depôt and repair ship Henrik Gerner completed 1928, displacement 490 tons, 2450 H.P., 13 knots, carries two 3-in. guns. Fishery protection vessels: Aegir, Odin, Thor (Iceland Government), Hvidjörnen, Diana, Fenris, Island Falk, Fylla (ex-British sloop Asphodel), Beskytteren, Maagen; Ingolf (1934, to replace Fylla) 3000 H.P., two 4·7 in. and two 6-pdr. guns, one seaplane.

Surveying vessel Marstrand, 158 tons, 11 knots.

Six minesweepers (ex-Torpedo boats *), 96 tons. Five patrol vessels (ex-Torpedo boats *), 96 tons.

* See Flotilla Tables.

FRANCE.—Battleships and Armoured Cruisers.

Class.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY (1922).*	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. Oil.	Complement.
														Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**France** . .	35,000	794 W.L.	0	108	6	26	7	..	Brest .	Bldg.	..	..	..	..	..	..	..	..	*15 in.*	..	..	..	..
b.	**1 in No**‡ .	35,000	794 W.L.	0	108	6	26	7	..	..	..	..	..	.	..	.	..	..	..	*15 in.*	..	..	..	..
b.c.	**Strasbourg** .	26,500	706	0	102	0	25	0	160,000	St. Nazaire	Bldg.	..	..	..	..	..	..	..	..	8 *13-in.*, 16 *5·2-in.*, 40 *smaller*, 2 catapults, 2 aircraft.	..	32	..	..
b.	**Dunkerque**§ .	26,500	706	0	101	8	27	11	100,000 -120,000	Brest .	1935	Bldg.	5,200,000	10–8	4–9	.	..	..	..	8 *13-in.*, 16 *5·2 in.*, 40 *smaller*, 2 catapults 2 aircraft.	..	abt. 29	..	..
b.	**Bretagne** . 1934	22,189	544	6	88	6	29	0	29,000 Nic. P.T.	Brest .	1913	1915	2,589,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 18 *5·5-in.*, 4 *3-in.* A.A., 5 *3-pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2700 300	1167
b.	**Condorcet** .	17,597	480	11	84	7	27	0	22,500 Nic. P.T.	St. Nazaire	1909	1911	2,165,200	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾ K.S.	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2100 —	890
b.	**Courbet** . . 1930	22,189	544	6	88	6	29	0	28,000 Nic. P.T.	Lorient .	1911	1913	2,508,388	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 2 *3-pr.*, 4 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2600 250	1140
b.	**Diderot** . .	17,597	480	11	84	7	27	0	22,500 Nic. P.T.	St. Nazaire	1909	1911	2,167,000	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 2 *3-pr.* A.A., 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2000 —	890
a.c.	**Ernest Renan**	12,234	521	7	70	0	27	6	37,600 Nic. Recip.	St. Nazaire	1906	1909	1,410,000	6¾–4 H.S.	2	5–3 H.S.	4¾	6 H.S.	5 H.S.	4 *7·6-in.*, 12 *6·5-in.*, 2 *3-in.* A.A., 4 *3-in.*, 8 *9-pr.* A.A., 2 *1-pr.*	2 (sub.) 18″	24·4 *t*	1870 —	874
b.	**Jean Bart** . 1930	22,189	544	6	88	6	29	0	28,000 B. P.T.	Brest .	1911	1913	2,528,888	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 4 *3-pr.*, 4 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2360 300	1140
a.c.	**Jules Michelet**	11,072	489	0	70	3	27	0	30,000 Guyot Recip.	Lorient .	1905	1908	1,204,107	6–4 K.S.	2	5–3 K.S.	6 H.S.	8 K.S.	5 K.S.	4 *7·6-in.*, 12 *6·5-in.*, 2 *3-in.* A.A., 10 *3-pr.*, 2 M.	2 (sub.) 18″	22·8	1870 —	724

b.	**Lorraine** 1936 .	22,189	544	6	88	6	29	0	29.000 B. P.T.	St. Nazaire	1913	1916	2,642,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 18 *5·5-in.*, 7 *3-in.* A.A., 5 *3-pr.*, 2 *1-pr.*, 2 L.	4 (sub. 18″	20·0	2700 800	1167
b.	**Paris** 1934 . .	22,189	544	6	88	6	29	0	28,000 N. P.T.	La Seyne .	1912	1914	2,603,920	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 4 *3-pr.*, 7 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2450 250	1140
b.	**Provence** 1935 .	22,189	544	6	88	6	29	0	29,000 P.T.	Lorient .	1913	1915	2,589,000	11 7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 18 *5·5-in.*, 4 *3-in.* A.A., 4 *3 pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2700 300	1167
b.	**Voltaire** . .	17,597	480	11	84	7	27	0	22,500 B. P.T.	La Seyne .	1909	1911	2,169,200	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾ K.S.	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 2 *3-pr.*, 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2000 —	890
a.c.	**Waldeck-Rousseau** .	12,617	521	4	70	7	27	6	35,286 Nic. *t.* recip.	Lorient .	1908	1910	1,301,380	6½–3½	2½	5	4¾	6	5½	14 *7·6-in.*, 10 *3-in.*, 10 *9-pr.* A.A., 2 *3-pr.*, 2 M.	2 (sub.) 18″	23·0 *t*	1900 —	874

* The London Naval Treaty (1930), suspended the replacement of capital ships during the years 1931—36 inclusive. † Reported to be not less than 9 inches.
‡ To be laid down after January 1, 1937. § Built in dry dock.

All the above battleships were reconstructed and modernised between 1923 and 1930.
Since 1930 all except Diderot, Condorcet and Voltaire have been taken in hand for conversion to oil-fuel burning.

Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
														Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.			knots.	tons.	
A.C. .	**Bearn** * . . .	22,146	597	1	89	0	29	10	37,000	Chantiers de la Mediterranée. La Seyne	1920	1928	..	3½	..	8 *6·1-in.*, 6 *3-in.* A.A., 8 *1-pr.* A.A., 12 M. A.A., 41 planes	4 21·7″	21·5	— 2070	875
Aircraft Transport	**Commandant Teste**	10,000	548	0	88	7	23	6	21,000 †	Chantiers de la Gironde, Bordeaux	1929	1932	..	2 1½	..	12 *3·9-in.* A.A., 8 *3-pr.* A.A., 12 M., 19 planes, 4 catapults, 5 cranes.	—	20·5	oil	648

* Originally designed and laid down as a battleship; to be reconditioned. † Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

FRANCE.—Cruisers.

(See pages 208–9 for the armoured cruisers Ernest Renan, Jules Michelet and Waldeck-Rousseau.)

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
														Belt.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.			knots.	tons.	
Training cruiser	Jeanne d'Arc .	6496	557	8	58	0	18	8	32,000	Penhoet Yard, St. Nazaire	1930	1931	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *1·6-in.*, 2 M., 2 seaplanes	2 21·7″	26	..	506
1931–32 *pr.*	Jean-de-Vienne	7600	590	0	57	5	16	5	84,000	Lorient .	1933	Bldg.	..	..	..	9 *6-in.*, 8 *3·5-in.* A.A., 8 *1-pr.*	4 21″	31	..	..
	La Galissonnière									Brest .		1935								
1932–33 *pr.*	Marseillaise	7600	590	0	57	8	17	5	88,000	Ch. de la Loire, St. Nazaire	1935	Bldg.	..	4¾	..	9 *6-in.*, 8 *3·5-in.* A.A., 2 seaplanes	4 21″	32½	..	..
	Gloire . .									Bordeaux	1935									
	Montcalm .									La Seyne	1935									
	Georges Leygues									Penhoet Yard, St. Nazaire	1935									
—	Algérie . . .	10,000	610	3	64	8	20	0	84,000 (G.) Pen.	Brest . .	1932	1934	1,920,000	about 4	..	8 *8-in.*, 12 *3·9-in.* A.A., 8 *1-pr.*, 16 M., 2 catapults, 2 seaplanes	2 triple 21″	31	oil	746
Suffren Class	Dupleix . .	10,000	636	6	63	0	20	7	90,000 (G.)	Brest .	1930	1932	1,570,000	..	..	8 *8-in.*, 8 *3·5-in.* A.A., 6 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults.	2 triple 21″	32	oil	605
	Foch . .										1929	1931	1,450,000							
	Colbert . .										1928	1931	1,270,000							
	Suffren . . .	10,000	607 b.p.	0	63	0	20	7	90,000 (G.)	Brest .	1927	1930	1,210,000	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults	2 triple 21″	32	— 1800	605
Duquesne Class	Tourville .	10,000	626	8	62	4	20	7	120,000 (G.)	Lorient .	1926	1928	..	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.*, 2 seaplanes, 1 catapult	2 triple 21″	33·2	— 2000	620
	Duquesne .									Brest .	1925									
Duguay-Trouin Class	Duguay-Trouin	7249	594	10	56	6	17	0	110,000 (G.)	Brest .	1923	1926	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *3-pr.*, 2 M., 1 L., 1 seaplane, 1 catapult	4 triple 21·7″	33	— 1480	578
	Primauguet .									Brest .	1924	1927								
	La Motte Picquet									Lorient .	1924	1927								

cr.	***Strasbourg** (*ex-* **German Regensburg**)	4723	468	1	45	0	17	0	26,000 32,500t P.T.	Bremen (Weser)	1914	1914	417,810	4–2½	2	7 *5·9-in.*, 1 *3-in.* A.A., 4 M., 120 mines.	4 19·7 a.w.	26·0	$\frac{1200}{423}$	438
M.Cr.	**Emilé Bertin**	5886	580	0	52	5	16	4	100,000–120,000 P.T. (G.)	Penhoet, St. Nazaire	1933	1934	..	..	..	9 *6-in.*, 4 *3·5-in.* A.A., 8 *1-pr.*, 250 M., 1 catapult, 2 aircraft.	6 21·7″ a.w. (T.)	34·0	oil	550
,,	**Pluton**	4773	498	9	49	3	17	0	57,000 (G.)	Lorient	1929	1931	..	..	..	4 *5·5-in.*, 10 *1-pr.*, 12 M., 1000 mines.	—	30·0	oil	..

* To be sold.

River Gunboats.—**Francis Garnier (1929), 639 tons, 15 knots, two 4-in., one 3-in. A.A.; Vigilante, Argus (1924), 218 tons 12 knots, two 3-in; Balny (1921), 201 tons,** 14 knots, one 3-in.; La Grandière (1921), 39 tons, 11 knots; Doudart de Lagrée (1909), 183 tons, 14 knots; Mytho, Tourane (1934), 95 tons, 250 H.P. (Diesel), 10 knots, one 3 in.; Chaloupe Fluviale (1926), 38 tons, 9 knots, 1 small gun; Avalanche and Commandante Bourdaise (1920), 128 tons, 16.5 knots, one 3-in. gun.

Gunboat.—Jouffroy d'Abbans, 400 tons, 15 knots, 2-3 in., building.

Minesweepers.—Conquérante (1918), 374 tons, 17 knots, two 3·9-in.; Luronne (1917), 265 tons, 13·8 knots, two 3·9-in.; Impétueuse, Batailleuse, Audacieuse (1917), 265 tons, 15 knots, two 3·9-in.; Engageante, Diligente (1917), 360 tons, 17 knots, two 3·9-in.; Agile, Inconstant, Ardent (1916), 310 tons, 17 knots, two 3·9-in.; Étourdi (1916), 310 tons, 17 knots, two 3·9-in.; Gracieuse, Dédaigneuse, Tapageuse, Surveillante (1916), 315 tons, 15 knots, two 3·9-in.; Granit, Mica, Meulière, Quartz (1918), 354 tons, 12·5 knots, one 9-pr.

Minelayers.—Castor, 3,150 tons, 14 knots, three 3·9-in., two 1·5 A.A.; Pollux, 2,460 tons, 14 knots, three 3·9-in. Both converted 1930.

Submarine Parent Ship.—Jules Verne (1931), 5,747 tons, 7,000 H.P. (Diesel), 16 knots, mounting four 3·5-in. A.A., four 1-pdr. A.A.

Sloops.—Bougainville, Dumont D'Urville, Savorgnan de Brazza, and d'Entrecasteaux (1932–1933), Rigault-de-Genouilly Amiral Charner, and D'Iberville (1933–1935), 1970 tons, 3,200 H.P. (Diesel), 15·5 knots, armament three 5·5-in., four 1-pr. A.A., 6 M., 50 mines, 1 seaplane. Ville d'Ys (1917) (on fishery protection duties), 1,122 tons, 17 knots, mounting one 3·9-in., three 3-in. (1 A.A)., 2 M.; Régulus (1917), Antares, Aldébaran, Bellatrix, Algol, Altair (1916), 1122 tons, 17 knots, mounting two 5·5-in., two 3-in. A.A., 2 M.

Despatch Vessels.—Duperré Class:—Du Couedic, Enseigne Henry, Duchaffault, Dubourdieu (1919-1920), 453 tons, 17 knots, one 5·4-in., one 3·9-in. "Arras" Class:—Reims, Remiremont, Révigny, Belfort, Calais, Lassigny, Les-Eparges, Vauquois, Vimy, Ypres, Epinal, Nancy, Coucy, Laffaux, Amiens, Tahure, Arras, Bapaume (1919–1923), 644 tons, 20 knots, two 5·4-in., one 3-in. A.A. guns (Belfort detached to Air Ministry—no armament, and Ypres employed on hydrographic work—no armament. "Aisne" Class:—Ailette, Ancre, Scarpe, Suippe, Meuse, Yser, Somme, Oise, Aisne, Marne (1917–1918), 490–600 tons, 21 knots, four 3·9-in. guns. Quentin-Roosevelt for fishery protection (1918), 586 tons, 13 knots, one 3-in gun. Four Avise dragueurs of 640 tons, 20 knots, two 3.9-in. guns, laid down in 1935, and four vessels are projected.

Net-Layers.—Le Gladiateur, is being built at Lorient, 2,300 tons, 387 feet long, 7,700 H.P., 20 knots, four 3·5 in. A.A., 6 M. A second is projected.

Escorteurs (Convoy Sloops).—Bayonnaise, Cordelière, Poursurvante, Incomprise, Melpomene, Flore, Pomone, Iphigenie, Branle-Bas, Bombarde, Bouclier and Baliste (building), 600 tons, two 3·9-in. guns, 16-in. t.t., 30 knots.

Surveying Ships.—Amiral Mouchez, 800 tons, 12 knots. La Péronne and Beautemps-Beaupré (1920), 780 tons, one 3-pdr. A.A. Astrolabe, Octant, and Gaston-Rivier (1918), 460 tons, 10 knots; Soudé (1911), 50 tons, 10 knots; Chimère (1901), 330 tons, 14 knots; Utile (1894), 450 tons, 13 knots, one 3-pdr.

C.M.Bs.—V.T.B. 1 (1922) (55 feet), 10 tons, 37 knots; V.T.A. 1 (1921) (50 ft.), 5 tons, 37·6 knots. V.T.A. 2 (1929), 6 tons; V.T.B.'s, 45 and 7, 11 tons, 1000 H.P., 39 knots, two torpedoes; V.T.B.'s 8, 9 and 10, 19 tons, 2000 H.P., 46 knots.

Submarine Chasers.—Nos. 1-4 (building), 148 tons, 2,400 H.P., 20 knots, one 3-in gun. Twenty-seven in number (1918), 70 tons, 16 knots, one 3-in gun.

GERMANY.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed	Coal. / Oil.	Complement.
														Belt.	Deck.	Side above Belt	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.			
																		Heavy Guns.	Second-ary.					
		tons.	ft.	ins.	ft.	ins.	ft.	ins					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Ersatz Elsass**	26,000 (standard)	..		..		..		..	Kiel	Bldg.	..	..	..	..	..	..	..	..	9 *11-in.*, 12 *5·9-in.*	..	..	..	..
b.	**Ersatz Hessen**		..		..		..		..	Wilhelmshaven		..	..	..	..	..	..	..	..		..	..	..	..
*b.**	**Deutschland**	10,000 (standard)	609		67	6	19	0	54,000 -56,800 Diesel ‡	Deutsche Werke, Kiel	1931	1933	estimated 3,750,000	about 4	1½–3	—	—	about 7	—	6 *11-in.*, 8 *5·9-in.*, 6 *3·4-in.* A.A., 8 *1-pr.*	8 19·7″ (Q.)	26	— / 1200	634
*b.**	**Admiral Scheer**									Wilhelmshaven	1933	1934	estimated 3,530,000											
*b.**	**Admiral Graf Spee**									Wilhelmshaven	1934	1936	estimated 3,530,000					—						
b.	**Hannover** †	13,040	413	1	72	10	25	3	17,000 T.S. recip.	Wilhelmshaven	1905	1907	1,157,500	9½–4 K.S.	3	8 K.S.	6 K.S.	10–6 K.S.	6¾ K.S.	4 *11-in.*, 14 *6·7-in.*, 4 *3·4-in.* A.A., 23 M.	4 a.w. 19·7″	18	1771 / 197	727
b.	**Hessen**	12,988	413	5	72	10	25	3	16,000 T.S. recip.	Kiel (Germania)	1903	1905	1,157,500	9–4 K.S.	3	6 K.S.	6 K.S.	10–6 K.S.	6 K.S.	4 *11-in.*, 12 *6·7-in.*, 4 *3·4-in.* A.A., 23 M.	4 a.w. 19·7″	18	1574 / 197	727
b.	**Schlesien** †	13,040	413	1	72	10	25	3	17,000 T.S. recip.	Schichau Germania	1906	1908	1,214,000	9½–4 K.S.	3	8 K.S.	6 K.S.	11–6 K.S.	6¾ K.S.	4 *11-in.*, 12 *5·9-in.*, 4 *3·5-in.* A.A., 23 M.	4 a.w. 19.7″	18	1771 / 197	727
b.	**Schleswig-Holstein** †																							

* Officially rated as "Armoured Ships."

† Reconstructed 1925–30.

‡ Consists of eight double acting two stroke M.A.N. Diesels.

GERMANY.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
												Belt.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft. ins.	ft. ins.	ft. ins.						£	in.	in.			knots.	tons.	
h.c.	**G** . .	10,000	..	..	..	..	..	..	laid down 1935	..	..	..	..	8 *8-in.*	..	..	..	..
h.c.	**H** . .																	
l.c.	**Leipzig** . .	6000	543 10 (on W.L.)	53 5	15 7	72,000† [geared turbines 60,000, Diesels 12,000]	Wilhelmshaven	..	1929	1931	2,050,000	3–4	..	9 *5·9-in.*, 6 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	— / 1500 (including Diesel oil)	534
l.c.	**Nürnberg** . .	6000	..	..	..	72,000	Kiel	..	1934	1935	..	..	..	9 *5·9-in.*, 8 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	..	..
l.c.	**Köln** . .	6000	570 10	49 10	17 8	65,000‡	Wilhelmshaven	..	1928	1930	1,785,000	3–4	..	9 *5·9-in.*, 4 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	— / 1200	500
l.c.	**Karlsruhe**						Deutsche Werke, Kiel	..	1927	1929	1,985,000							
l.c.	**Königsberg**						Wilhelmshaven	..	1927	1929	2,100,000							
l.c.	**Emden** * . .	6000	510 2	46 11	17 4	46,500 (G.)	Wilhelmshaven	..	1925	1925	..	3	..	8 *5·9-in.*, 3 *3·4-in.* A.A.	2 twin *19·7-in.* a.w.	29	1100 / 700	483

Gunnery Training Ships.—Drache (1908), 778 tons, 15 knots, 4 4.1-in.; Fuchs (1919), 517 tons, 16 knots, 2 4·1-in. Gunnery Tender Bremse (Wilhelmshaven, 1932), 1,250 tons, 339½ feet long, 31 ft. 2 in. beam, 25,000 H.P. (Diesel), 27 knots, 4 4·1-in. guns, complement 112. A second new Gunnery Tender, Ersatz Hay, is authorised (to be laid down in 1936).

Fishery Protection Vessels.—Weser and Elbe (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots; Zieten (1919), 541 tons, 17 knots.

Experimental Vessels.—Pelican and Nautilus (500 tons, 17 knots), Grille (470 tons, 10 knots).

Minesweepers.—29 in number (reciprocating machinery). 475-525 tons, 16 knots. Six are projected.

Sailing Training Ship.—Gorch Fock (Hamburg, 1933) (replacing the Niobe). Three-masted barque, 239 feet in length, 1,500 tons, 500 H.P. auxiliary motor giving 8 knots.

Barrage Craft.—R 1—8 (1933), 85 ft., 44 tons, 700 H.P., 17½ knots. Mining and Barrage vessels MT 1 and 2, 550 tons, 10 knots; 12 small craft.

Patrol or Guard Boats.—S 1—6 (1932), 92 ft., 46 tons, 2,400 H.P., 31½ knots. UZ 27—35, 102 ft., 60 tons, 500 H.P., 14 knots. UZ 15, 17, 18, 21, 10 tons, 25 knots.

Target Ship.—Zähringen (ex-battleship), 11,800 tons. Wireless controlled. Target Tugs and Control Ships.—Pfeil and Blitz, 650 tons. 30 knots *ex* T.B.'s. Blitz is control ship for Zähringen.

Fleet Tenders.—Hela, Nordsee. Station Tenders.—Nixe, Frauenlob.

Surveying Vessels.—Meteor (1924), 1150 tons, 11 knots, one 3·4-in., and two surveying launches, 90 tons.

* Training Ship. Being converted to oil fuel burning.

† Three propeller shafts, of which the centre shaft is Diesel-driven and the outers turbine-driven. Diesels used for cruising or combined with the turbines to give full speed.

‡ Parsons geared turbines with Diesels for cruising.

GREECE.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. / Oil.	Complement
															Gun Position.						
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
a.c.	**Giorgios Averoff** *	9301	462	69	24¾	19,000 (21,500 *t*) B.	Leghorn (Orlando)	1910	1911	1,100,000	8–3½ K.S.	1¾	7	7	8–6½	7	4 *9·2-in.*, 8 *7·5-in.*, 16 *3-in.*, 4 *3-pr.*, 2 *3-in.* A.A., 2 M.	8 (sub.) *18-in.*	22½ (24 *t.*) ‡	1500 —	..
cr.	**Helle** † (*ex* Fei-Hung)	2083	322	39	14	6000 P.T. (G.)	Camden, N.J.	1912	1914	240,000	..	1½	..	..	..	..	3 *6-in.*, 1 *3-in.* A.A., 110 mines	2 a.w. *18-in.*	20 ‡	600 100	280

* Retubed and refitted 1927. † Repaired and converted to oil burning in France and fitted as a minelayer in 1929. ‡ Probable speed 15 knots.

Old gunboat (gunnery school tender), Amvrakia, 470 tons. Training ship, Ares, 1,870 tons, 10 knots, four 3-in. guns, completed at Chantiers de la Méditerranée, la Seyne, 1929. Repair ship, Hephestos (1920), 4,549 tons gross, 11½ knots. Surveying ship (old sloop), Nautilus, 400 tons, 11 knots, two 3-in guns. Dispatch vessels, Korghia Lenios (1916), 380 tons, 13½ knots, and Kichli (1884), 86 tons, 10 knots. C.M.B's., two Thornycroft type, 55 ft. 4 built at Venice, 69 ft., for Customs Service. One light cruiser projected.

ITALY.—Battleships.

Class.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY (1922.).*	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel Coal. Oil.	Complement.
													Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ins.	ft.	ins.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Littorio	35,000	754	7	103	8	28	125,000 (G.T.)	Genoa (Ansaldo)	Bldg.	..	..	..	..	..	..	..	..	15 *in.* guns	..	..	..	..
b.	Vittorio Veneto								Trieste														
b.	Andrea Doria 1937	21,555	575	9	92	0	29	34,000 P.T. Y.	Spezia	1913	1916	..	10–4 K.S.	1¾	6 K.S.	..	9½ K.S.	6 K.S.	13 *12-in.*, 16 *6-in.*, 13 *3-in.*, 6 *3-in.* A.A., 2 *2-pr.*, 6 M., 4 L., 1 catapult, 1 aircraft	2 (sub.) *18-in.*	21	1200 800	1074
b.	Caio Duilio 1936							31,000 P.T. Y.	Castellammare	1913	1915												
b.	Conte di Cavour‡ 1936	21,603	577	4	92	0	29	31,000 P.T. Bl.	Spezia	1911	1915	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5 K.S.	13 *12-in.*, 18 *4·7-in.*, 13 *3-in.*, 6 *3-in.* A.A., 2 *2-pr.*, 2 M., 4 L., 1 catapult, 1 aircraft	2 (sub.) *18-in.*	22	1430 840	1074
b.	Giulio Cesare ‡ 1935	21,818	577	5	92	0	29	31,000 P.T. B. & W.	Genoa (Ansaldo)	1011	1914	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5	13 *12-in.*, 18 *4·7-in.*, 13 † *3-in.*, 6 *3-in.* A.A., 2 *2-pr.*, 2 M., 4 L., 1 catapult, 1 aircraft	2 (sub.) *18-in.*	22	1430 690	1074
§	Pisa †	8759	460	11	68	11	24¾	21,000 recip. Belleville	Leghorn (Orlando)	1907	1909	..	8–3 K.S.	1¾	7 K.S.	7 K.S.	8–6 K.S.	6½	4 *10-in.*, 8 *7·5-in.*, 12 *3-in.*, 6 *3-in.* A.A., 2 *3-pr.*, 4 M., 2 L.	2 (sub.) *18-in.*	23	1486 138	687
§	San Giorgio	9232	462	2	69	0	24¾	19,000 recip. Bl.	Castellammare	1908	1910	..	8–3 K.S.	1¾	7 K.S.	7 K.S.	7–6 K.S.	7 K.S.	4 *10-in.*, 8 *7·5-in.*, 10 *3-in.*, 6 *3-in.* A.A., 2 *3-pr.*, 6 M., 2 L.	2 (sub.) *18-in.*	23	1556 115	643
§	San Marco **	9350						23,000 P.T. B.			1911										32½	1550 66	

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* The London Naval Treaty (1930) suspended the replacement of capital ships during the years 1931–36 inclusive. † Cadets training ship. To be boys' training ship.

‡ Being completely modernised. **Reported that centre triple turret will be removed and speed to be increased to 26 knots.**

§ Armoured Cruisers, classified as Battleships, 2nd class, in Italian Official Lists. ** Being converted into target ship under wireless control.

ITALY.—Cruisers, &c.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Side. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.			knots.	tons.	
Improved Condottieri Class	Duca degli Abruzzi Guiseppe Garibaldi	7894	593 8	57 5	15	100,000	Cantieri Riuniti dell' Adriatico, Trieste Odero-Terni, Orlando Spezia	1935	Bldg.	..	..	..	8 *6-in* , 6 *3·9-in.*, 8 *1-pr.* A.A , 8 M.	6 21″	35	..	..
Attendolo Class	Eugenio di Savoia Filiberto Duca d'Aosta	6791	613 4	57 5	15	110.000	Ansaldo, Genoa Orlando, Leghorn	1933	Bldg.	..	..	..	8 *6-in.*, 6 *3·9 in.*, 8 *1-pr.* A.A., 8 M., 1 catapult, 3 aircraft	6 21″	36½	..	..
Zara Class	Pola	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1931	1933	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smlr., 1 catapult, 2 aircraft	—	32 (33 t.)	oil	840
Condottieri Class	Montecuccoli Muzio Attendolo	5857	597 0	54 6	14·2	110,000	Ansaldo, Genoa Trieste	1933 1934	1935	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.* A.A., 8 M.	4 21″	37	oil	..
Zara Class	Gorizia	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1930	1931	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 12 smlr., 1 catapult, 2 aircraft	8 21″	34	oil	840
Modified Trento Class	Bolzano	10,000	646 0	67 8	..	150,000	Ansaldo, Genoa	1932	1933	..	..	..	8 *8-in.*. 16 *3·9-in.* A.A., 12 smaller, 1 catapult, 2 seaplanes.	8 21″	36	oil	..
Condottieri Class	Armando Diaz Luigi Cadorna	5008	554 6	50 10	14	95,000 (G.)	Odero-Terni, Spezia Stabilimento Tecnico Triestino, Trieste	1932 1931	1933	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 M., 1 catapult, 2 seaplanes	4 21″ (D.)	37 (39¾ t.)	oil	..
Zara Class	Zara Fiume	10,000	599 10	67 8	20·2	95,000 (G.)	Odero-Terni, Muggiano Stabilimento Tecnico Triestino, Trieste	1930	1931	..	4 —	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smaller, 1 catapult, 2 aircraft	—	32	$\overline{2200}$	800
Condottieri Class	Alberto di Giussano Alberico da Barbiano Bartolomeo Colleoni Giov. delle Bande Nere	5069	556 5	50 10	14·2	95,000 (G.)	Ansaldo, Sestri-Ponente Castellamare	1930	1931 1931 1932 1932	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.*, 8 M., 1 catapult, 2 seaplanes	4 21″ (D.)	37	oil	500

Trento Class	**Trieste** ‡ . **Trento** . .	10,000	646	2	67	9	18	150,000 (G.)	Orlando, Leghorn Stablemento Tecnico, Trieste .	1926 1927	1929	..	2¾ / 2	..	8 *8-in.*, 16 *3·9-in.* A.A., 4 *1-pr.*, 8 M., 1 catapult, 2 seaplanes.	8 a.w. (D.)	35 36	— / 3000	1000 800
l. c. .	**Ancona** . . . (*ex* German Graudenz)	3838	468	3	45	0	18½	30,000 tur.	Kiel . . .	1913	1915	..	4–2½ / 1	..	7 *5·9-in.*, 3 *3-in.* A.A., 3 M., 120 mines, 1 catapult	2 19·7″	27·5	1279 / 400	364
„ .	**Bari** (*ex*-German Pillau)	3248	443	11	44	7	13½	28,000 tur.	Danzig (Schichau) .	1914	1915	..	— / 1½–¾	1	8 *5·9-in.*, 3 *3-in.* A.A., 3 M., 120 mines	2 19·7″	27·5	984 / 250	372
„† .	**Brindisi** (*ex*-Austrian Helgoland)	2756	428	7	41	11	13	25,600 tur.	Fiume . . :	1912	1914	..	2½ / ¾	..	9 *3·9-in.*, 1 *3-in.* A.A., 3 M., 1 L., 170 mines	4	27·0	750 / —	330
„ .	**Libia** . . .	3700	367	0	47	6	16	11,500 recip.	Genoa (Ansaldo) .	1912	1913	..	— / 1½	..	8 *4·7-in.*, 3 *3-in.* A.A., 3 M.	..	22·9	640 / —	317
l. cr. † .	**Quarto** . .	2904	431	9	42	2	13½	29,000 P.T. Bl.	Venice . .	1911	1912	..	— / 1½–¾	..	6 *4·7-in.*, 4 *3-in.*, 2 *2-pr.* A.A., 3 M., 126 mines	2 a.w. 18″	28	49 / 482	256
l. cr. .	**Taranto** (*ex*-German Strassburg)	3184	455	0	42	2	12½	27,000 P.T. T.S.	Wilhelmshaven	1911	1914	416,340	4–2½ / —	2	7 *5·9-in.*, 2 *3-in.* A.A., 3 M., 120 mines	2 19·7″	27	1200 / —	373
l. cr.† .	**Venezia** (*ex*-Austrian Saida)	2756	428	7	41	11	13	25,600 tur.	Monfalcone .	1912	1914	..	2½ / ¾	..	9 *3·9-in.*, 1 *3-in.* A.A., 3 M.	4	27·0	750 / —	330
s.c. .	**Miraglia** * . .	4882	397	0	49	3	17	12,000 P.T.	Spezia . . .	1923	1927	..	..	..	4 *4-in.* A.A., 1 M., 2 catapults, 16 planes	—	21·5	— / 440	300

* *Ex*-merchant ship, taken over on the stocks. † Classified as Scouts in Italian Lists. ‡ Fleet Flagship.

COMBINED MINELAYERS AND MINESWEEPERS.—Fasana, Buccari, Durazzo, and Pelagosa, completed 1926, 531 tons, 11 knots (I.C. machinery), 1 *3-in.* gun, 200 mines; Azio, Legnano, Lepanto, Dardanelli, Milazzo, and Ostia, completed 1926-7, 615 tons, 15 knots (recip.), 2 *4-in.*, 1 *3-in.*, 200 mines.

MINELAYERS.—Marghera and Brondobo, 117 tons, 13 knots, 1 *3-in.*, 60 mines; Laurana, Rovigno, and Albona (*ex*-Austrian), 112 tons, 11 knots, 1 *3-in.*

MINESWEEPERS.—Cotrone, Viesti, 475 tons, 13·8 knots, 2 *4-in.* guns; 38 in No., 200 tons, 14 knots, 1 *3-in.* gun

OIL TRANSPORTS.—Marte, Dalmazia, Istria, Livenza, Urano, Prometeo, Cocito, Lete, Stige, Niobe, Cerere, Giove, Tarvisio, Quarnero. Oil transport with under-water protection, Brennero, 10,000 tons, 10½ knots.

GUNBOAT, Arimondi (1910), 432 tons, 9 knots, 2 *3-in.* A.A. guns. RIVER GUNBOATS.—S. Caboto (1912), 863 tons, 13 knots, 6 *3·in* guns; E. Carlotto (1918), 180 tons, 14 knots, 2 *3-in.* A.A. guns. ESCORT GUNBOATS.—A. Bafile, T. Farinati, E. Giovannini, C. del Greco, and A. Vitturi (1922), 182 tons, 23 knots, 2 *4-in.* guns, 2 T.T.

SURVEYING VESSELS.—Ammiraglio Magnaghi (1914), 1800 tons, 14 knots, 4 *3-in.*; Cariddi (1916), 330 tons, 10 knots: Scilla (1916), 350 tons, 11 knots; Tritone (1913), 340 tons, 10 knots. 42 ARMED MOTOR BOATS (M.A.S.) built and 6 under construction

PATROL VESSELS.—Cherso and Lussin (1912), 4000 tons, 10½ knots; Lante and Bianco (1917), 280 tons, 12 knots; Lutti and Cirene (1912), 340 tons, 10 knots; Corsini (1912), 290 tons, 12 knots; Rimini (1912), 319 tons, 9½ knots; Gallipoli (1911), 310 tons, 10½ knots; Otranto (1911), 290 tons, 10 knots; Giannutri (1912), 680 tons, 13 knots; Alula (1912), 308 tons, 13 knots.

TRAINING SHIPS.—Cristoforo Colombo (Castellamare, 1928), 3,000 tons, 10 knots (Diesel-electric); Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 *3-in.* A.A. SUBMARINE DEPÔT SHIPS (Sloops).—Volta and Pacinotti (1924), 2,362 tons, 19 knots, 1 *4-in.*, 2 *4-in.* A.A.

OLD CRUISER.—F. Ferrucio (1905), 6,299 tons, 13,500 H.P. (recip.), 19·3 knots. CABLE SHIP.—Citta di Milano (5,500 tons), 10 knots.

One submarine chaser, Albatros, 340 tons, 24½ knots, 2 *3·9-in.* and 1 *1·5-in.* A.A., building at Palermo.

JAPAN.—Battleships.

Type.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY (1922).*	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Second-ary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.						in.	in.	in.	in.	in.	in.			knots.	tons.	
Fuso Class	**Fuso** § 1937	29,330	673 0	94 0	28 6	40,000 B.C.T.	Kure	1914	1915	..	12·4 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L., 1 seaplane	2 (sub.) *21-in.*	22·5	4000 1300	1300
	Hyuga 1940	29,990	683 0	94 0	28 8	45,000 tur.	Nagasaki (Mitsubishi)	1917	1918								12 *14-in.*, 18 *5·5-in.*, 4 *3-n.* A.A., 2 M. H.A., 2 seaplanes, 1 catapult	6 (sub.) (D) *21-in.*	23	4500 1300	1360
	Ise 1939	29,990	683 0	94 0	28 8	45,000 B.C. tur.	Kobe (Kawasaki)	1916	1917	..	12 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 18 *5·5-in.*, 6 *3-in.* A.A, 2 M. H.A., 2 seaplanes	6 (sub.) (D) *21-in.*	23	4500 1300	1360
	Yamashiro § 1938	29,330	673 0	94 0	28 6	40,000 B.C.T.	Yokosuka	1915	1917	..	12 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6·in.*, 8 *5 in.* A.A., 4 M., 4 L., 1 seaplane	6 (sub.) *21-in.* (D)	22·5	4000 1300	1272
Kongo Class	**Haruna** ‡ 1935	29,330	704 0	95 0	27 6	64,000 P.T.	Kobe (Kawasaki)	1913	1915	..	8–3 K.S.	2¾	6	..	10 K.S.	6 K.S.	8 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L. 1 seaplane	4 (sub.) *21-in.*	26	— 4000	1250
	Kirishima ‡ 1936	29,330	704 0	92 6	27 6	64,000 P.T.	Nagasaki (Mitsubishi)	1913	1915	..											
	Kongo ‡ 1934	29,330	704 0	92 0	27 6	64,000 P.T.	Barrow	1912	1913	2,500,000											
Nagato Class	**Mutsu** † 1942	32,720	700 0	95 0	31 0	80,000 (G.)	Yokosuka	1920	1921	..	12–9 K.S.	3½	..	..	14	..	8 *16-in.*, 20 *5·5-in.*, 8 *5-in.* A.A., 3 M., seaplanes (Mutsu 2, Nagato 3)	4 (sub) 4 a.w *21-in.*	23	1600 3400	1304 1367 (as fleet flagship)
	Nagato † 1941						Kure	1919	1920												

Armoured Cruisers now rated as **Coast-defence Ships** (1st class), completed 1899–1904: Nisshin, 7080 tons, 20 knots, 4 8-in., 14 6-in.; Kasuga, 7080 tons, 20 knots, 1 10-in., 2 8-in., 14 *6-in.*; Yakumo, 9010 tons, 20 knots, 4 8-in., 12 6-in.; Adzuma, 8640 tons, 20 knots, 4 8-in., 12 6-in.; Idzumo and Iwato, 9180 tons, 16 knots, 4 8-in., 14 6-in.; Asama, 9240 tons, 21½ knots, 4 8-in., 12 6-in.; Tsushima (2nd class), 3120 tons, 20 knots, 6 6-in., 8 3-in., 1 3-in. A.A.

* The London Naval Treaty (1930) suspended the replacement of capital ships during the years 1931–36 inclusive. § Modernised 1934. † Being modernised.

‡ Modernised 1928–1931, including fitting of bulges and new foremast, and conversion to oil burning. Hiyei of this class has been de-militarised and converted to a training ship in accordance with London Naval Treaty.

JAPAN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed	Fuel. Coal. / Oil.	Complement.
											Side / Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft. ins.					£	in.	in.			knots.	tons.	
A.C.	**Akagi** *	26,900	763 b.p.	92	21 2	131,200 (G.)	Kure	1925	1927	..	..	..	10 *8-in.*, 12 *4·7-in.* A.A., capacity for 50 aircraft. Carries about 30 aircraft	—	28·5	4000	..
A.C.	**Hosho** †	7470	510 b.p.	48	15 0	30,000 (G.)	Tsurumi (Asano)	1921	1922	..	..	..	4 *5·5-in.*, 2 *3-in.* A.A., 20 aircraft	—	25	— / 2700	550
S.C.	**Kamoi** §	17,000	495 b.p.	67	28 0	8,000 turbines and electric drive	New York S.B. Co.	1922	1922 (converted 1933)	..	..	..	2 *5·5-in.*, 16 seaplanes	—	15	4000	..
A.C.	**Kaga** ‡	26,900	715 b.p.	102½	22 1	91,000	Kobe (Kawasaki)	1921	1928	..	..	..	10 *8-in.*, 12 *4·7-in.* A.A., capacity for 60 aircraft. Carries about 30 aircraft	—	25	— / 5300	..
S.C.	**Notoro** §	14,050	455 b.p.	58	26 6	5,850 recip.	Kobe (Kawasaki)	1920	1920	..	..	..	2 *4·7-in.*, 2 *8-in.* A.A., 16 seaplanes	—	12	— / 1000	..
A.C.	**Ryujo**	7100	548	60 8	15 0	40,000 (G.)	Yokohama	1931	1933	..	..	..	12 *5·1-in.*, A.A., 24 aircraft	—	25	oil	600
A.C.	**Soryu**	10,000	..	..	..	..	..	Bldg.	..	..	..	..	..	—	..	..	..
S.C.	**Chibose**	10,000	..	..	..	..	..	Bldg.	..	..	..	..	..	—	..	..	..

* Designed as a battle cruiser. † Fitted with gyro-stabiliser. ‡ Designed as a battleship. § Converted from oilers. Seaplane carriers. Other vessels carry landplanes.

JAPAN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Side. / Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
	Tone	8500	614 3 w.l.	63·1	14·7	90,000	Nagasaka	Bldg.	..	..	..	..	15 *6·1-in*, 8 *5-in.* A.A.	..	..	..	..
Mogami Class	Mogami	8500	625 w.l.	59½	13·1	90,000	Kure	1934	1935	2,500,000 estimated	..	..	15 *6·1-in.*, 8 *5-in.* A.A.	..	33	..	..
	Mikuma						Nagasaki	1934	1935								
	Suzuya						Yokosuka	1934	Bldg.								
	Kumano						Kawasaki	Bldg.	Bldg.								
Myoko Class	Chokai	9850	650	62½	16¼	100,000 (G.)	Nagasaki	1931	1932	..	3 / —	..	10 *8-in.*, 4 *4·7-in.* A.A., 2 M. 2 catapults, 2 seaplanes	8 21-in. a.w. (D.)	33	oil	692
	Maya						Kobe	1930									
	Atago						Kure	1930	1932								
	Takao						Yokosuka										
Nachi Class	Ashigara	10,000	630 b.p.	62½	16½	100,000 (G.)	Kobe	1928	1929	..	3 / —	..	10 *8-in.*, 6 *4·7-in.* A.A., 2 M., 1 catapult, 2 seaplanes	12 21-in. a.w. (T.)	33	— / 2500	692
	Haguro						Nagasaki		1929								
	Myoko						Yokosuka	1927	1929								
	Nachi						Kure		1928								
Furutaka Class	Kinugasa	7100	595	51	15¼	95,000 (G.)	Kawasaki, Kobe	1926	1927	..	..	..	6 *8-in.*, 4 *4·7-in.* A.A., 2 M., 1—2 planes, 1 catapult	12 21-in. a.w.	33	400 / 1400	604
	Aoba						Nagasaki	1926	1927								
	Furutaka						„	1925	1926	..	..	..	6 *8-in.*, 4 *3-in.* A.A., 2 M., 2 planes, 1 catapult				
	Kako						Kawasaki, Kobe	1925	1926								
Chikuma Class	Hirado	4400	475	46½	16¾	22,500 P.T.	Kobe	1911	1912	..	2¼ / —	..	8 *6-in.*, 2 *3-in.*, 2 *3-in.* A.A., 2 M.	3 18-in. a.w.	26	900 / 300	410
	Yahagi						Nagasaki										
Natori Class	Abukuma	5170	535	47¼	15¾	90,000 (G.)	Uraga	1923	1925	..	2 / —	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in. a.w. (D.)	33·0	300 / 1260	450
	Isudzu						Uraga	1921	1923								
	Nagara						Sasebo	1922	1922								
	Natori						Nagasaki (Mitsubishi)	1922	1922								

Natori Class	Yura	5170	535	47¼	15¾	90,000 (G.)	Sasebo	1922	1923	..	2/—	..	7 *5·5-in.* 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in. a.w (D.)	33·0	300/1260	450
	Kinu						Kawasaki	1922	1922								
Sendai Class	Jintsu	5195	535	47¼	15¾	90,000 (G.)	Kawasaki	1923	1925	..	2/—	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in.	33·0	300/1260	450
	Naka						Yokohama	1925	1925								
	Sendai						Nagasaki	1923	1924								
Kuma Class	Kiso	5100	535	47¼	15¾	90,000 (G.)	Nagasaki	1920	1921	..	2/—	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 80 mines	8 21-in. a.w. (D.)	33·0	300/1260	439
	Kitakami						Sasebo	1920	1921								
	Kuma						Sasebo	1919	1920								
	Oi						Kobe	1920	1921								
	Tama						Nagasaki (Mitsubishi)	1920	1921								
Tenryu Class	Tatsuta	3230	468	40¾	13	51,000 (G.)	Sasebo	1918	1919	..	..	..	4 *5·5-in.*, 1 *3-in.* A.A., 2 M. Fitted for minelaying.	6 (T.)	31	—/900	332
	Tenryu						Yokosuka										
—	Yubari	2890	435 b.p.	39½	11¾	57,000 (G.)	Sasebo	1923	1923	..	..	..	6 *5·5-in.*, 1 *3-in.* A.A., 2 M. 34 mines	4 21-in. a.w. (D.)	33	—/820	328

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* A replenishment programme of new construction is projected to cover a period of 3 or 4 years and comprising 2 cruisers (8500 tons), 2 aircraft carriers (10,000 tons), 14 destroyers (1400 tons), 6 submarines (of a total tonnage of 7500 tons), a minelayer (5000 tons), 8 torpedo boats.

MINELAYERS.—Matsushima (440 tons); Sarushima; Nashimi, 443 tons, 19 knots, 2 3-in; Katsuriki (1917), 1540 tons, 13 knots, 3 3-in., 150 mines; Itsukushima (Uraga, 1929), 1970 tons, 16 knots, 3000 H.P. (Diesel), 3 5·5-in., 2 3-in. A.A.; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 17 smaller vessels, 300—400 tons, about 12 knots. Okinoshima building.

MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 20 knots, 2 4·7-in., 1 3-in. A.A. Nos. 9, 10 (1918), 770 tons, 24 knots, 2 4·7-in.; Nos. 13—14 (1933), and Nos. 15—16 (Building), 492 tons, 2 4·7-in. guns, and Nos. 17 and 18 are projected.

GUNBOATS.—Saga (1912), 685 tons, 15 knots, 1 4·7 in., 3 3-in. A.A.; Uji (1903), 540 tons, 13 knots, 4 3-in.; Ataka (1922), 725 tons, 16 knots, 2 4·7-in., 2 3-in. A.A.

RIVER GUNBOATS.—Futami (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun Katata, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 215 tons, 15 knots, 2 3 in.; Fushimi (1906), 150 tons, 14 knots, 2 6-pr.; Sumida (1906), 105 tons, 13 knots, 2 6-pr.; and Kotaka (1930), 50 tons, 15 knots, 5 M.G.

SUBMARINE DEPÔT SHIPS.—Taigei (building at Yokohama), 10,000 tons, 689 feet, 13,000 H.P., 20 knots, 4 5-in. A.A.; Chogei (1924), Jingei (1923), 5160 tons, 16 knots, 4 5·5-in.; Komahashi (1914), 1230 tons, 13·9 knots, 2 3-in, 1 3-in. A.A.; Karasaki (1896), 9750 tons, 13 knots, 1 3-in., 1 3-in. A.A.

ANTI-SUBMARINE NETLAYERS.—Yayeyama (1932), 1135 tons, 4800 H.P. (reciprocating machinery), 20 knots, 2 4·7-in. A.A.; Shirataka (1929), 1324 tons, 16 knots, three 4·7-in. A.A. guns. Tsubane and Kamone (1929), 450 tons, 19 knots, 1 3-in.

SUBMARINE CHASERS.—Two building at Ishikawajima. Reported to be 300 tons, 24 knots.

REPAIR SHIP AND SUBMARINE SALVAGE SHIP.—Asahi (ex-Battleship, 12,000 tons). Salvage Ships. Cable Ships. Transports and other auxiliaries.

NETHERLANDS.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Gun Position.		Armament.		Speed.	Fuel.		Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.	Torpedo Tubes.		Coal.	Oil.	
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons.		
cr.	Celebes **	6000	560	51	16	70,000 P.T. Y.	Rotterdam (Wilton-Fijenoord)	..	Bldg. est 1935	..	3	..	..	..	..	..	6 *5·9-in.*, 4 *4·2-in.* A.A., 4 M., 1 catapult, 2 seaplanes	—	32	..		450
cr.	Java *	6670	509½	52½	18	65,000	Flushing	1921	1925	..	3	..	1	..	4	..	10 *5·9-in.*, 4 *3-in.* A.A., 8 M., 40 mines, 2 seaplanes	—	30	—	1070	490
,,	Sumatra *						Amsterdam	1920	1926													
a.g.b.	Brinio	540	172¼	28	9¼	1200 Diesel	Amsterdam	1912	1914	..	2 K.S.	¾	..	..	..	..	4 *4·1-in.*, 2 M.	—	14	34	—	52
,,	Friso							1912	1914													
,,	Gruno							1913	1915													
c.d.s.	Hertog Hendrik §	4371	317	50	19	6282 *t.* Y.	Amsterdam	1902	1903	347,500	6 H.N.S.	2	..	..	10 H.N.S.	3 H.S.	2 *9·4-in.*, 6 *5·9-in.*, 4 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	1a.w. 2 sub 18″	16·5 *t*	710	—	347
,,	Jacob van Heemskerck †‖	4445	321½	50	19	6396 *t.* Y.	Amsterdam	1906	1908	347,500	6–4 H.N.S.	2	..	..	10 H.N.S.	6 H.N.S.	2 *9·4-in.*, 6 *5·9-in.*, 6 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M., 2 seaplanes	—	16·5 *t*	520	—	351
c.d.s.	Marten Tromp †	4562	330	50	18¾	6405 *t.* Y.	Amsterdam	1904	1906	347,500	6–4 H.N.S.	2	..	..	10 H.N.S.	3 H.S.	2 *9·4-in.*, 4 *5·9-in.*, 8 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	—	16·7 *t*	710	—	349
,,	De Zeven Provincien † * Not on seagoing list. (employed as training ship)	5644	333	56	20¼	8516 *t.* Y.	Amsterdam	1909	1910	..	6–4 K.S	2	..	..	10 K.S.	4 K.S.	2 *11-in.*, 4 *5·9-in.*, 10 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	—	16·3 *t*	885	—	409

Ships marked * above are in the East Indies Squadron. ** For Indian Military Marine, to be renamed De Ruyter. † Of little fighting value. § To be replaced in 1935. ‖ To be replaced in 1938.

Gunboats.—(Indian Military Marine): **Soemba, Flores (1926–7), and Johann Maurits van Nassau (1933), 1457 tons, 15 knots, three 5·9 in., one 3-in. A.A., 2 M.**

Minelayers.—Nautilus (1930), used for fishery protection, 955 tons, 14 knots, one 3-in., two 1-pr., 2 M.; Douwe Aukes & Van Meerlant (1922), 749 tons, 13·5 knots, three 3-in. A.A., 2 M., 130 mines; Medusa and Hydra (1911), 670 tons, 11·5 knots, three 3-in., one 1-pr., 1 M., 65 mines; a new vessel authorised and eight old vessels. Minelayers attached to Indian Military Marine: Krakatau (1924), 1120 tons, 17 knots, two 3-in A A., 2 M., 150 mines, 1 catapult, and 1 seaplane; Pro Patria (1923), 605 tons, 11 knots, one 3-in. A A., 2 M., 80 mines; Prins Van Oranje and Gouden Leeuw (1932), 1206 tons, 15 knots, two 3-in., and 1 aircraft; Rigel (1931), 1100 tons, 12½ knots, 160 mines; Hercules (1910), 188 tons, 10½ knots, and three old vessels.

Minesweepers.—I.–IV., 270–295 tons; (for the Indian Military Marine): A, B, C, D (1930), 187 tons; and one 1600 tons building.

Surveying Vessels.—Eilerts de Haan, Hydrograaf, and in the Indian Military Marine, Van Doorn, Van Gogh, Tydeman, and Willebrord Snellius.

Submarine Depôt Ships.—Cornelius Drebbel (1915), 787 tons, 170 H.P. (Diesel), 6 knots; and (in Indian Military Marine) Pelikaan (1922), 2600 tons, 1400 H.P., 12 knots, four 2·75 in., 4 M. 4 C.M.B.'s. (Thornycroft 1928).

Old Light Cruiser Gelderland (1900), 3966 tons, now used as gunnery training ship. Old Gunboats (1877–9): Hefring, 265 tons, Braga, Tyr and Freyr, 275 tons, 7–8 knots.

NORWAY.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.			in.	in.			knots.	tons.	
c.d.s.	Eidsvold Norge	4166	310¼	50½	16½	4500 Y.	Elswick	1900	1901	350,000	6 H.N.S.	2	..	..	6 H.N.S.	6 H.N.S.	2 *8·2-in.* 6 *5·9-in.*, 8 *3-in.*, 6 *3-pr.*	2 (sub.) 18-in	16·5	550 —	270
”	Harald Haarfagre .	3860	304	48½	16½	4500	Elswick	1896	1898	300,000	7 H.S.	2	..	..	8 H.S.	..	2 *8·2-in.*, 6 *3-in-*	3 18-in.	16·5	550 —	249
”	Tordenskjold*							1897	1899								2 *8·2-in.*, 6 *4·7-in.*, 6 *3-in.*, 2 *3-in.* A.A., 6 M.	2 (sub.) 18-in.			

Fishery Protection Vessels: Fridtjof Nansen (1931), 1050 tons, 15 knots, 2000 H.P., two 4-in., two 2-pr.; Heimdal (1892), 660 tons, 12 knots; four 12-pr.; and Michael Sars. Minelayers: Fröya (1918), 760 tons, 22 knots, 4 4-in., 100 mines; Glommen and Laugen (1918), 335 tons, 9½ knots, 150 mines; old gunboats, refitted as minelayers, Tyr, Gor, Vidar, Brage, Nor, Vale, and Uller, 230-280 tons, armed with one 4·7-in and other guns. Olav Trygrason,†† minelayer and training ship, built at Horten, 1600 tons, 21¾ knots, 6000 H.P., 4 4·7-in. and 1 3-in. A.A. guns, and 2 T.T.S. (18 in.), 280 mines. Submarine Depôt Ship, Sarpen, 187 tons, 9 knots, two 9-pr. and one 1-pr.

Four sloops (1400 tons) and six minelayers, 500 tons, are projected, but no money has yet been voted.

* Employed as training ship for Cadets.

†† 1500 H.P. Diesels, 4500 H.P. turbines. Max. speed on Diesels, 14 knots.

SOVIET UNION.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.	Complement.
												Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		Coal. / Oil.	
																Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.							in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Paris Commune (*ex*-Sevastopol) †	23,606	594	87	27½	42,000 ‡	Baltic Works	Baltic Works	1911	1915	..	9–5	3	..	..	12–10	6	12 *12-in.*, 16 *4·7 in.*, 4 *3-in.* A.A., *and smaller*	4 (sub.) 18-in.	23	2000 / 1000	1130
b.	October Revolution (*ex*-Gangut)																					
b.	Marat (*ex*-Petroparlovsk)																					
b.	General Alexieff* (*ex*-Volya)	22,600	551¼	89¾	27	26,500	Nikolaev R.S.B.Co.	..	1914	1917	..	12–4	3–1½	9–8	..	12–8	5	12 *12-in.*, 18 *5-in.*, 4 *2·5-in.* A.A., 4 *3-pr.*, 8 *11-pr.*, 4 M.	4 (sub.) 18-in.	21	2300 / 720	125

* Under French protection at Bizerta. † 1 aircraft. ‡ These ships are being modernised; underwater protection and re-engining.

SOVIET UNION.—Cruisers.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt. / Deck.	Gun Position	Guns.	Torpedo Tubes.		Coal / Oil	
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
cr. „	Admiral Istomin Admiral Kornilov	7600	..	..	..	..	..	..	Bldg.‡	..	..	..	.. ..	..	..	..	..
l. cr.	**Aurora** (*ex*-S.S.S.R)	6730	416	55	21	11,600	Petrograd	1900	1903	..	..	..	14 *6-in.*, 5 *6-pr.* A.A., 2 M.	..	20	964 / —	578
„	**Almaz** *	3300	363	43½	17½	7,500	..	1903	1904	..	— / 3	..	7 *4·7-in.*, 2 M.	..	19	650 / —	300
„	**Chevonaya-Ukrainia** (*ex*-Ad. Nakhimov)	6934	507	50⅓	18½	50,000	Nikolaev	1915	1923	..	..	..	15 *5·1-in.*, 4 *3-in.*, 8 *3-in.* A.A., 4 M., 100 mines, 2 flying boats	12	29½	540 / 690	600
„	**Komintern** † (*ex*-Pamyat Merkuriya)	6675	440	54½	20½	19,500	Nikolaev	1903	1907	..	..	..	15 *5·1-in.*, 4 *3-in.*, 4 *6-pr.*, 1 aircraft	2 (sub.)	23	1190 / —	595
„	**General Kornilov** * (*ex*-Kagal)	6675	439½	54½	20½	19,500	Sevastopol	1902	1905	..	..	..	16 *6-in.*, 2 *11-pr.*	2 (sub.)	23	1100 / —	595
„	**Krasni Kavkaz** § (*ex*-Ad. Lazarev)	7600	535	51½	19	60,000	Nikolaev	1916	1930	..	3 / 1	3	4 *8-in.*, 4 *3-in.* A.A., 4 *4-in.* A.A., 4 M., 100 mines, 2 seaplanes	(a.w.)	29½	540 / 690	650
„	**Profintern** (*ex*-Svietlana)	7600	507	50⅓	18½	50,000	Reval	1915	1925	..	3 / 1	3	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 1 aircraft	(a.w.)	29½	540 / 690	..
„	**Voroshilov** (*ex*-Ad. Grieg)	7600	507¾	50⅓	18½	50,000	..	..	1930	..	..	..	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 1 aircraft	(a.w.)	29½	540 / 690	..

* Under French protection at Bizerta. Disarmed. † Training ship. ‡ Originally designed as sister ships to Krasni Kavkaz, launched in 1914.

§ Krasni Kavkaz has been modernised, and instead of 15 5·1-in. guns, she is now fitted with 4 8-in.

4 sloops, 4 gunboats, 4 river gunboats, 21 minesweepers, 13 despatch vessels, about 50 C.M.B.s (some may be building), some submarine chasers, and miscellaneous other craft.

2 coastguard vessels, 761 tons, 4-in. guns, are building in Italy (Ansaldo, Genoa).

SPAIN.

Class	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Side. / Deck.	Armour. Gun Position	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	ins.	ins.			knots.	tons.	
b.	Jaime I.	14,224	459¼	78¾	25½	15,500 P.T. Y.	Ferrol	1914	1921	..	8–5 K S. 2–1	10 (heavy) 3 (sec.)	8 *12-in.*, 20 *4-in.*, 4 *3-pr.*, 4 *3-pr.* A.A., 2 M.	—	20·2 *t*	1850/20	854
l. cr. "	Canarias Baleares	10,000	636	64	17·4	90,000 P.T.(G.) Y.	Ferrol	1931 1932	1934	..	4/3	1	8 *8-in.*, 6 *4·7-in.*, 4 *4·7-in.* A.A., 8 *2-pr.* A.A., 2 seaplanes; 1 catapult.	12 21-in. (T.)	33·0	—/2750	700
" " "	Miguel de Cervantes Almirante Cervera Libertad (*ex*-Principe Alfonso)	7475	579½	54	16½	80,000 P.T.(G.) Y.	Ferrol	1928 1925 1925	1930 1928 1927	..	3/—	..	8 *6-in.*, 4 *4-in.* A.A., 2 *3-pr.*, 1 M.	12 21-in. (T.)	33·0	—/1680	560
"	Republica (*ex*-Reina Victoria Eugenia)	4857	462	50	15¾	25,500 P.T.	Ferrol	1920	1923	..	3–1½/—	3	9 *6-in.*, 4 *3-pr.* A.A., 1 *3-in.*, 4 M., 1 L.	4 21-in.	25·5	1200/230	404
"	Mendez Nuñez	4509	462	46	14½	45,000	Ferrol	1922	1924	..	3	..	6 *6-in.*, 4 *3-pr.* A.A., 4 M.	12 21-in. (T.)	29	800/500	320
g.b. " "	Eduardo Dato Jose Canalejas Antonio Canovas del Castillo	1335 (normal)	253½	33½	11¼	1700	Ferrol	1923 1922 1922	1925 1924 1923	..	..	..	4 *4-in.*, 2 *3-pr.*, 2 M.	—	15	324/—	131
" "	Lauria Laya	800 (normal)	213¾	30	9¼	1100 Y	Cartagena	1912 1911	1912 1911	..	..	..	4 *3-in.*, 2 M.	—	14·0	148/—	121
s.c.	Dédalo	11,385	418	55	23	3000	..	..	1922	..	..	..	2 *4·1-in.*, 4 *3-in.*, A.A., 25 seaplanes	—	13	1000/—	350

Motor-launches, M 1, 2, 4, 5, 6; H 2, 3, 4, 40 tons. Sailing Training ships: Sebastian Elcano (1928), 3500 tons, 800 H.P. (Diesel), 9·5 knots; Galatea (*ex*-Clarastella) (1903), 2500 tons, bought in Italy. Nine armed trawlers (built in Britain). Eight fishery protection vessels. Three C.M.B.s. (*ex*-British).

Submarine salvage vessel Kanguro (1917), 2750 tons, 10 knots, four 2-pr. Surveying ship Giralda (1894), 2400 tons, 20 knots, two 6-pr. guns. Tofino, 1200 tons, building at Ferrol.

Three coastguard patrol vessels, 250 tons, authorised; and three fishery protection vessels are projected.

2 minelayers, 2000 tons, are projected. The 1931 estimates provide for the modernisation of two cruisers.

SWEDEN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost	Armour.						Armament.		Speed.	Fuel	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		Coal. Oil.	
															Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons	
c.d.s.	**Aran** . . .	3361	287	49¼	16·7	7000 Y. *t*	Gothenburg	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·2 *t*	300 —	287
,,	**Drottning-Victoria**	6899	396·7	61	21½	22,000 (G.) Y.	Gothenburg	1917	1921	666,000	8–6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 6 *3-in.*, 2 *6-pr.*, 2 M.	—	23·0	690 98	450
a.c.	**Fylgia** . .	4060	378	48·6	20·6	12,444 Y. *t*	Stockholm .	1905	1907	385,700	4 K.S.	2	..	..	5 K.S.	5 K.S.	8 *5·9-in.*, 10 *6-pr.*, 2 *1-pr.* .	2 sub. 18-in.	22·7 *t*	900 —	328
Hangar Cruiser	**Gotland** . .	4527	442	50·6	14·7	33,000 (G.)	Gothenburg	1931	1934	910,000 (esti-mated)	..	..	..	..	..	..	6 *6-in.*, 4 *3-in.* A.A., 4 M., 100 mines, 8 aeroplanes, 1 catapult	6 21-in.	27·0	oil	453
c.d.s.	**Gustav V.** .	6899	396·7	61	21½	22,000 (G.) Y.	Malmö . .	1918	1922	666,000	8–6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 *11-in.* 8 *5·9-in.*, 4 *3-in.* A.A., 2 *6-pr.*, 2 M.	—	23·0	690 98	450
,,	**Manligheten** .	3361	287	49¼	17·4	7400 Y.	Malmö .	1903	1904	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·0	300 —	287
,,	**Oscar II** . .	4085	313·6	50·5	18	9000 Y.	Gothenburg	1905	1907	..	6 K.S.	2	6 K.S.	6 K.S.	7½ K.S.	5 K.S.	2 *8·3-in.*, 8 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	18·0	500 —	330
,,	**Sverige** . .	6899	392·7	61	21½	20,000 tur. Y.	Gothenburg	1915	1917	666,000	8–6 K.S.	1½	4 K.S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 6 *3-in.*, 2 *6-pr.*, 2 M.	—	22·5	690 98	450
,,	**Tapperheten** .	3361	287	49¼	17·7	6000 Y.	Malmö .	1901	1903	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	16·5	300 —	287
,,	**Wasa** . .	3361	287	49¼	17	6500 Y.	Stockholm .	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	17·2	300 —	287

Gustav V. and Sverige have been reconstructed and modernised (1929–33). Drottning-Victoria is also to be reconstructed. Two older coast-defence ships, Oden, Thor (1897, 1899) (reconstructed 1915–16), 3297 tons, 16½ knots, 5500 H.P. 2 10-in., 6 4·7-in., 8 6-pr. guns, to be used as depôt ship for flying-boats. Minelayer Clas Fleming,* 1800 tons, 4 4·7-in., 20 knots, 100 mines; Vedette boats (employed as minesweepers), Sökaren, Sveparen, Sprängeren (1918), and 12 others, to be fitted as minelayers. Jagaren, Kaparen, Snapphanen and Väktaren, 250 tons, 177 ft. long, 27 knots, 2 3-in. Torpedo gunboats, Jacob Bagge, Oernen, Psilander, 738 tons, 2 4·7-in., 1 torpedo tube (15-in.), 20 knots. Gunboat Svensksund (1891), 354 tons. Depôt ship for submarines, Sven (1886), 3300 tons, 4 4·7 in. Aircraft depôt ship Dristigheten (1901), 3620 tons. Depôt Ships:—Niord (1898), 3297 tons; Göta, 3350 tons. Sailing training ships: Af. Chapman, Najaden, Jarramas and Falken (1877–1900).

* Reported to be having Diesels fitted.

UNITED STATES.—Battleships.

											Armour.						Armament.			Fuel.		
															Gun Position.							
Class.	NAME. Date for Scrapping and Replacement under Washington Treaty (1922).*	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers	Where Built.	Date of Launch.	Date of Completion.	Cost. §	Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.	Torpedo Tubes.	Speed.	Coal.	Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.		
b.	**Arizona** † 1937	32,600	608	106¼	27½	33,376 B. & W. P. tur.	New York (Navy Yard)	1915	1916	1,485,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	21·0	—	2322	1400
b.	**Arkansas** * 1935	26,100	562	106	26	30,000 P. tur.	New York (S.B. Co.)	1911	1912	964,000	11–5 K.S.	3	..	8–6 K.S.	11 K.S	6½	12 *12-in.* (50 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	20·5	—	5100	1430
b.	**California** 1941	32,600	624	97½	30½	28,500 tur. electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 M., 2 *1-pr.*, 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	—	4656	1412
b.	**Colorado**. 1942	32,500	624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921	1923	1,383,000	13½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	—	4570	1407

b.	**Idaho** ‡ . 1939	. 33,400‖	624	97⅓	29	32,000 B. & W. P.T.	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 3271	1374
b.	**Maryland** 1941	. 31,500	624	97½	29¾	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920	1921	1,383,000	13½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 4570	1410
b.	**Mississippi** ‡ . 1938	33,000‖	624	97⅓	28½	32,000 B. & W. C.T. (G.)	Newport News	1917	1917	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 3271	1374

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* See note * on p. 231. † See note † on p. 231. ** See note ** on p. 231.

‡ Modernised, 1934. The particulars given above are prior to modernisation. (See ‡, p. 231.) ‖ Increased by about 3000 tons during modernisation.

§ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

UNITED STATES.—Battleships—*continued.*

Class.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY.**	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Nevada** § . 1936 *	29,000	583	108	27½	25,000 Y. P. tur.	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½–8 K.S	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	20·5	— 2000	1820
b.	**New Mexico** ‡ 1939	33,400	624	97⅓	28⅓	28,500 B. & W. Electric drive	New York . (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 3271	1414
b.	**New York** * . 1935 *	27,000	573	106	26	28,100 B. & W. recip.	New York . (Navy Yard)	1912	1914	1,315,114	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— 5200	1450
b.	**Oklahoma** § . 1936 *	29,000	583	108	28½	25,300 B. & W. recip.	New York . (S.B. Co.)	1914	1916	2,200,000	13½–8 K.S.	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	—	20·5	— 2000	1820
b.	**Pennsylvania** † 1937	33,100	608	106¼	28	33,376 B. & W. Cur. tur.	Newport News	1915	1916	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes.	—	21·0	— 2300	1880
b.	**Tennessee** . . 1940	32,300	624	97½	30¼	26,800 B. & W. Tur electric drive.	New York (Navy yard)	1919	1920	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 4656	1412

b.	**Texas*** 1935 **	27,000	573	106	26	28,100 recip.	Newport News	1912	1914	1,166,000	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— 5200	1450
b.	**West Virginia** 1942	31,800	624	97½	30	27,300 B. & W. tur. electric drive.	Newport News	1921	1923	1,383,000	13½–1 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 4570	1407

Battleship Utah was converted to a mobile target ship in 1931 in accordance with the London Naval Treaty, and the battleship Wyoming was converted to a training ship (speed 18 knots) in 1931 in accordance with London Naval Treaty.

* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboilering, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. New Mexico and Mississippi completed 1933. Idaho completed 1934. Modernisation includes fitting, increased deck protection increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboilering, fitting of new turbines (the electric drive in New Mexico has been replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

The modernisation of California, West Virginia, Colorado, Maryland, and Tennessee is projected.

** The London Naval Treaty (1930) suspended replacement of capital ships between the years 1931–36 inclusive.

UNITED STATES.—Aircraft Carriers

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
A.C.	**CV7**	14,700	..	..	..	..	..	..	Bldg.	..	..	..	.. ..	..	..	..	..
A.C. A.C.	**Yorktown** **Enterprise**	19,900	762 (on W.L.)	83	21¾	120,000	Newport News	..	Bldg. est. 1936	..	..	.	*5-in.* A.A. guns.	..	..	..	..
A.C.	**Ranger CV4**	14,500	727 (on W.L.)	80	19	53,500 (G.)	Newp't News S. B. Co.	1933	1934	about * 4,000,000	..	..	8 *5-in.* A.A., 76 aircraft	..	29¼	Oil	1434
A.C.	**Lexington**	33,000	880	104	31½	180,000 tur.electric	Bethlehem S. B. Co. (Fore River)	1925	1927	9,000,000	..	..	8 *8-in.* (55 cal.), 12 *5-in.* (25-cal.) A.A. 4 *6-pr.* Operates about 80 landplanes.	..	33½	7100	1670 *ex* Air
A.C.	**Saratoga**	33,000	888	106	31	180,000 tur.electric	N.Y. Shipbuilding Co.	1925	1927	9,000,000	..	..		..	33½	7100	
A.C.	**Langley** †	11,500	542	65½	19	72,000 tur.electric	Mare Island Navy Yard	1912	1922 as aircraft carrier	..	.	..	4 *5-in.* (51 cal.), operates 32 landplanes, 2 catapults.	—	15	— / 2000	411

For particulars of Aircraft Tenders and Repair Ships, see page 234.

* The estimated cost has been increased from 19 million dollars to 21 million dollars to allow for the conversion of the vessel from a "flush-deck" type of carrier to an "island" type of carrier during construction.

† Formerly Collier Jupiter, converted 1921 at Norfolk Navy Yard.

UNITED STATES.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour. Belt. Deck	Armour. Gun Position.	Armament. Guns.				Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.						knots.	tons.	
Phœnix Class	Phœnix	10,000 estimated	..	..	..	..	N.Y.S. Co., Camden	..	..	2,395,000	..	..	..	..	..	..	..	..	..	..
	Boise						Newport News	..	..	2,330,000	..	..	..	..	..	..	..	..	..	..
	Honolulu						N.Y. Navy Yard	..	..	..	..	..	6-*in.*	..	..	..	..	..	..	..
	CL 49																			
	CL 50																			
Wichita Class	Wichita	10,000 estimated	..	..	..	..	Philadelphia New York	..	..	..	..	..	8 *in.*	..	..	..	..	..	..	..
Brooklyn Class	Savannah	10,000 estimated	600 (on W.L.)	61½	19¾	95,000	N.Y.S. Co., Camden	..	estd. end of 1936	2,410,000 estimated	..	..	15 6-*in.*				..	32	..	..
	Nashville						N.Y.S. Co., Camden													
	Brooklyn						New York Navy Yard													
	Philadelphia						Philadelphia Navy Yard													
Quincy Class	Vincennes	10,000 estimated	575	61¾	19½	107,000	Bethlehem S. B. Corp., Quincy	..	Bldg est. 1937	2,410,000 estimated	..	..	8-*in.* guns				..	..	..	..
	Quincy								Bldg. est. 1936	1,860,000 estimated										

Astoria Class	**Tuscaloosa**	10,000 esti-mated	578 (overall) 573 (on W.L.)	61¾	19½	107,000 (G.)	New York, S. B. Co.	1933	1934	2,090,000 estimated	reported to be more heavily armoured than the earlier 10,000-ton cruisers	..	9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft, 50 mines	—	32½	oil	602
	San Francisco						Mare Island Navy Yard										
	New Orleans						New York Navy Yard			2,460,000							
	Astoria						Puget Sound Navy Yard			2,460,000							
	Minneapolis						Philadelphia Navy Yard			2,460,000							
Portland Class	**Portland**	9800	584 (on W.L.)	66	17½	107,000 (G.)	Bethlehem S. B. Co. Quincy	1932	1933	2,210,000			9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft	6 21-in.	32½	oil	602
	Indianapolis	9950					New York S. B. Co.	1931	1932	2,250,000							
Chester Class	**Northampton**	9050	600	65	16·3–17·6	107,000 P.T. (G.)	Bethlehem, S. B. Corp., Quincy	1929	1930	2,180,000	3 — ..	..	9 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4-6 seaplanes	6 21-in. (T)	32¾	oil	611
	Chester	9200		65			American Brown Boveri Elec. Corp.	1929	1930	2,230,000							
	Louisville	9050		66			Puget Sound Navy Yard	1930	1931	2,290,000							
Augusta Class	**Chicago**	9300		68			Mare Island Navy Yard	1930	1931	2,280,000							
	Houston	9050		65			Newport News S. B. & D. D. Co.	1929	1930	2,170,000							
	Augusta	9050		66				1930	1931	2,170,000							
Omaha Class	**Cincinnati**	7050	555½	55⅓	13½	90,000 P.T. (G.)	Tacoma, Wash.	1921	1924	1,730,000	3 — ..	..	12 *6-in.* (53 cal.) (Cincinnati and Detroit, 10 *6-in.*), 4 *3-in.* (50 cal.) A.A., 2 *3-pr.*, 2 catapults, 2 aircraft	6 21-in. (T)	33·7	—: 1800	450
	Concord						Philadelphia (Cramp)			1,742,000							
	Detroit	7050	555½	55⅓	13½	90,000 C.T. (G.)	Bethlehem S. B. Co. Quincy	1922	1923	1,584,000	3 — ..	..					

UNITED STATES.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
Omaha Class	Trenton	7050	555½	55⅓	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1923	1924	1,823,000	3 — ..		12 *6-in.* (53 cal.) (Marblehead, 11 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Marblehead								1924	1,810,000							
	Memphis							1924	1925	1,838,000							
	Milwaukee						Tacoma, Wash.	1921	1923	1,794,000							
	Omaha	7050	555½	55⅓	13½	90,000 P.T. (G.) (Raleigh) C.T. (G.)	Tacoma, Wash.	1920	1923	1,823,000	3 — ..	..	10 *6-in.* (53 cal.) (Omaha, 12 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Raleigh						Bethlehem S.B. Co., Quincy	1923	1924	1,616,000							
	Richmond						Philadelphia (Cramp)	1921	1923	1,742,000							
Pensacola Class	Salt Lake City	9100	585½	64	16	107,000 P.T. (G.)	New York S.B. Co.	1929	1929	3,400,000	3 — ..	..	10 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4 planes	6 21-in. (T.)	32½	— 3000	603
	Pensacola						Navy Yard, New York	1929	1930								

Gunboats.—Tulsa (1923), and Asheville (1920), 1270 tons, 12 knots, 3 4-in., 2 3-pr., 3 1-pr.; Sacramento (1914), 1140 tons, 12¾ knots, 3 4-in., 2 3-pr., 2 1-pr.; and 6 others, used for training purposes; Charleston, building at Charleston Navy Yard, and Erie, building at New York Navy Yard, 2000 tons, 6-in. guns.

River Gunboats.—Guam (1927), Tutuila (1928), 370 tons, 14 knots, 2 3-in., 8 M.; Palos, Monocacy (1914), 180 tons, 13¼ knots, 2 3-in.; Panay, Oahu (1928), 450 tons, 15 knots, 2 3-in.; Luzon, Mindanao (1928), 575 tons, 16 knots, 2 3-in.

Minelayers.—Yosmite *ex*-San Francisco (1890), 3700 tons, 19½ knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 300 mines; Baltimore (1889), 3950 tons, 20 knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 2 1-pr., 300 mines; Oglala (1918), 4200 tons, 20 knots, 1 5-in., 2 3-in. A.A., 350 mines; 12 light mine-layers, *ex*-T.B.D.'s., mounting 4 4-inch guns.

Minesweepers.—37 in number, "Bird" class (1918, 1919), 840 tons, 1400 H.P., 14 knots, 2 3-in. A.A. guns authorised but not carried. 6 more are equipped as submarine salvage vessels (Chewink, Falcon, Mallard, Ortolan, Pigeon and Widgeon, built 1914–18, 1210–1270 tons, 14 knots).

Aircraft Tenders.—Patoka (1919), 16,800 tons, 10·9 knots, 2 5-in.; Heron (minesweeper) (1918), 950 tons, 14 knots, 2 3-in. A.A.; Jason (1913), 19,250 tons, 14·3 knots, 4 4-in., 27 planes. Aroostook (1918) (minelayer), 4950 tons, 20 knots, 1 5-in., 2 3-in. (can carry 350 mines); Argonne (1921), 9005 tons, 15 knots, 4 5-in.

Aircraft Repair Ship.—Wright, 9553 tons, 15 knots, 6000 H.P., 2 5-in., 2 3-in. A.A., 20 planes.

Destroyer Tenders.—Dobbin (12,450 tons); Whitney (12,450 tons), and Melville (7150 tons), 16 knots, 8 5-in., 4 3-in.; Altair, Denebola and Rigel, 7,600 tons, 10½ knots, 4 5-in., 4 3-in. A.A.; Black Hawk, 8900 tons, 13 knots, 4 5-in.; Bridgeport, 11,750 tons, 12½ knots, 8 5-in.

Submarine Tenders.—Holland (1926), 11,570 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Bushnell (1915), 2896 tons, 14 knots, 4 5-in.; Canopus (1919), 6615 tons, 13 knots, 2 5-in.; Camden (1900), 7596 tons, 12 knots, 4 4-in.; Beaver (1910), 5320 tons, 16½ knots, 4 5-in.

Repair Ships.—Medusa (1924), 8089 tons, 16 knots, 4 5-in., 2 3-in. A.A., 2 6-pr.; Vestal, Prometheus (1909), 6378 tons, 16 knots, 4 5-in., 1 3-in. 25 submarine chasers (80 tons), mounting 1 3-in. gun. Training Ships.—Wyoming (1912), 26,000 tons, demilitarised; Cheyenne (1902), 2800 tons.

5 Store ships, 6 Cargo ships, 3 Transports, 3 Hospital ships, 25 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), Craneship; Kearsage (capacity 250 tons), 2 ammunition ships, and other auxiliaries.

SHIPS OF THE LESSER NAVIES.

Albania.—Two gunboats (ex-German), 230 tons, 4 motor launches (built in Italy, 1928), 40 tons, 14 knots.

Austria.—Patrol vessels: Neretva, Compo (1915), 130 tons, 16 knots; Fogas (1915), 62 tons, 16 knots, and Pozsony (1915), 130 tons, 16 knots. Disarmed and are unserviceable.

Bulgaria.—Under the terms of the naval clauses of the Peace Treaty, Bulgarian warships of all classes, existing or under construction, were surrendered to the Allied and Associated Powers or broken up. All vessels are under the Ministry of Commerce for police and preventive duties; six torpedo boats (100 tons, 28 knots), two minesweepers (ex French), and six motor boats of little value.

China.—Cruisers: Ning Hai (Kobe, 1932) and Ping Hai, 1990 tons, 360 ft. length, 10,500 H.P., 24 knots, six 5·5-in. and six 3·1-in. guns, four 21-in. torpedo tubes; 2 aircraft; Chao Ho (Elswick, 1912, 2600 tons), Ying Jui (Barrow, 1912, 2460 tons, 20 knots)—two 6-in., four 4-in., two 3-in., six 3-pr., two 1-pr., two 18-in. torpedo tubes; Hai Yung, Hai Chou, and Hai Chen (Germany, 1897–1898, 2950 tons, 19½ knots)—three 5·9-in., eight 4-in. and smaller, one submerged torpedo tube; Hai Chi (Armstrong's, 1899, 4300 tons, 24 knots)—two 8-in., ten 4·7 in., twelve 3-pr., ten maxims, five torpedo tubes. Destroyers: Chien Kang and Hsiao An, of 390 tons, speed 32 knots, armament: two 3-in., four 3-pr., and two 18-in. T.T. Torpedo boats: Eight (62–90 tons). Gunboats: Yat Sen (1931), 1650 tons, 20 knots, two 6-in., four 3-in., Kianing, Haining (1933), 300 tons, and fourteen others. Funing, Suining (300 tons, 12 knots, two 3-in. guns), and several others building at Shanghai. River gunboats: Forty-two. Also several dispatch vessels and torpedo gunboats. There are, in addition, a few gunboats and miscellaneous vessels belonging to the water-police of the Kwang Tung Province. One seaplane carrier, Teuck Sheng, building. 2 cruisers, 4 destroyers, and 4 submarines are included in the new construction programme.

Colombia.—Gunboats: Presidente Mosquera, 200 tons; Cartagena, Santa Marta, Barranquilla (Yarrows, 1930), length 137½ feet, speed 13½ knots, two 3-in. A.A. The following two destroyers were purchased from Portugal early in 1934, Caldas and Antioquia

(1934), 1282 tons, length 319 ft., beam 31 ft, speed 36 knots, four 4·7 in. guns, one 1½-in. A.A., and eight 21-in. torpedo tubes; built by Yarrow's in Portugal. River gunboats: General Nerino and Esperanza, 400 tons, 15 knots. Motor boats: Cauca (1913), 50 tons, four Guardacostas (Yarrow, 1913), 20 tons. Patrol vessels: Junin, Cairabosso and Pechincha.

Cuba.—Light cruiser, Cuba, 2055 tons, 6000 H.P. 18 knots, two 4-in., six 6-pr., two 3-pr., four 1-pr., 2 M. Training ship: Patria (1911), 1200 tons, 16 knots, two 3-in., four 3-pr. Gunboats: Habana, Pinar del Rio, Villas, Matanzas (1912), 80 tons, 12 knots, one 1-pr.; 24 de Febrero, 10 de Octubre (1911), 218 tons, 12 knots, three 3-pr.; Baire (1906), 500 tons, 14 knots, four 3-in., two 3-pr., 1 M.; Yara (1895), 450 tons, 12 knots, two 6-pr.; 20 de Mayo (1895), 200 tons, 12 knots, two 3-pr., two 1-pr.; Enrique Villuendas (1899), 178 tons, 16 knots, two 3-pr.: Captain Quevedo (1932), 187 tons, 12 knots, two 1-pr., one 3-in. A.A., and General Zagas, 500 tons, two 1-pr. One patrol boat building at Havana, 115 tons, 3 guns.

Czecho-Slovakia.—There are two river gunboats carrying two 3-in. guns for training purposes and four small minelayers.

Ecuador.—Mine-laying patrol vessels Tarqui (50 tons), and gunboat Cotopaxi (1884), 700 tons.

Estonia.—Mine-layers Kalev and Olev, minesweepers Sourop and Ristna, two ice-breakers, and Peipus Lake gunboats Ahti and Tartu. Torpedo boat Sulev (*ex*-German A 32) (1917), 243 tons, 26 knots, two 3-in., 2 torpedo tubes; gunboat Laene, river gunboat Mardus. Two submarines building at Vickers', 620 tons surface displacement, 1200 H.P., 13½ knots on surface, 8½ knots submerged. Six C.M.B.'s are contemplated.

Finland.—Patrol boats Klas Horn (1892) (*ex*-Posadnik), Uusimaa (1919), Hämeenmaa (1918), Matti Kurki (1892) (*ex*-Voevoda), Karjala (1918) (*ex*-Filin), and Turunmaa (1918) (*ex*-Orlan); 7 C.M.B.'s; 6 ice-breakers, a minelayer (150 mines), 640 tons, and three mine-sweepers, and 21 motor launches. Two armoured gunboats (4-in. belt), Väinämöinen and Ilmarinen, length 305 feet, 4000 tons, 4000 H.P. (Diesel-electric), 15 knots, four 10-in. guns, eight 4·7-in guns, built at A/B Maskin and Brobyggnads, Abo (1932–3). Submarines Iku-Turso, Vetehinen and Vesihiisi (Abo, 1930), 450 tons, speed 15 knots surface, 9 knots submerged, one 3-in. gun; Saukko (Helsingfors, 1930), 99 tons, two torpedo tubes. Sailing training-ship Suomen Joutsen (*ex*-German Oldenburg) An ice-breaker and submarine depôt ship is projected.

Hayti.—Special service vessels, Nord Alexis (1891), 1230 tons, two 4·7-in.; Veretieres (1889), 270 tons; 17 Decembre, 851 tons; Pacifique, 488 tons.

Hungary.—Patrol vessels: Sopron, Debreczen, 138 tons, two 3-in., 4 M.; Kecskemet, Szeged and Gyor, 131 tons, four 3-in., 4 M.; Birago, 59 tons, one 3-in., 4 M.; also 12 motor launches.

Latvia.—Gunboat Virsaitis (*ex*-German M68), 480 tons, two 3-in., two 6-pr., one 3-in. A.A., one torpedo tube; 1 ice-breaker, Krisjanis Valdemars; 2 submarines (1927), Ronis and Spidola, $\frac{390}{514}$ tons $\frac{\text{surface}}{\text{submerged}}$ displ., $\frac{14\frac{1}{2}}{9\frac{1}{4}}$ knots, one 3-in. A.A., 2 M., 6 18-in. torpedo tubes; 2 mine-sweepers, Imanta, Viesturs, 225 tons, 14 knots, one 3-in. A.A., 4 M., 30 mines, completed in 1926; one submarine depot ship, Varonis, formerly an ice breaker; Surveying vessel, Hidrografs.

Manchukuo.—Gunboats Ting Pien, Chin Jen, Shen Lin, built by Harima Dock Co., Japan, 1934–35, 280 tons, 12 knots, 4 5-in. A.A. and A.A. machine-guns; gunboat Haifeng, 200 tons, 13 knots, and another similar. The following have been built recently by the Kawasaki Works at Harbin:—Tatung and Limin, 65 tons, 12 knots, 3 guns, Wenmin, Huimin, Pumin, Onmin, Keimin and Fumin, 15 tons, 10 knots, 3 machine guns. The following vessels were launched at the beginning of 1933 at Yokohama, Daichi Kaihen and Daini Kaihen, 15 knots, 3 machine guns, and the river gunboats Daido and Rinni, 56 tons, 13 knots, one 6-in. gun. Coastguard ships Kaiho, Kaisui, Katei, and Kaikwa, 45 tons.

Mexico.—Coast defence vessel Anahuac (1898), 3162 tons, 15 knots, two 9·4-in., four 4·7-in., four 6-pr., 2 M., 2 L.; gun-vessels, Tampico and Vera Cruz (Elizabeth Port, New Jersey, 1903); displacement, 980 tons; armament, two 4-in. Q.F., four 6-pr.; 16 knots; fitted to serve as transports for 200 troops, Bravo 1200 tons; 2,600 I.H.P.; 17 knots (Leghorn, 1904), and Aguas Prieta, 1200 tons; 1800 I.H.P.; 15 knots, two 4-in., two 6-pr. Two revenue cutters (*ex*-U.S. submarine chasers), 80 tons, 18 knots, 3-in. guns. Four patrol boats, 276 tons, one 6-pr., 9 knots. Ten coastguard vessels built in Spain, 1935, 130 tons, 26 knots, one 6-pr., two machine-guns, two 1-in. machine-guns, two ·5-in. machine-guns.

Paraguay.—Gunboats: Humayta and Paraguay (1931), 636 tons, 17 knots, four 4·7-inch, four 3-inch A.A. guns, six mines; two older, Capitan Cabral and Tacuari, 120 tons, completed 1910, two 3-in., two 6 prs., 10 knots. Two despatch vessels, with 3-in. guns and two vedettes.

Persia.—Gunboats: Babr and Palang (Italy, 1932), 950 tons, 205 feet long, 1900 H.P. (Diesel), 15 knots, two 4-in. and two 3-in. A.A. guns. Four motor patrol boats built in Italy (1932). Semorg, Chahbaaz, Karkas and Sharock, 330 tons, 900 H.P. (Diesel), 15 knots, two 3-in guns. Also several old small gunboats and motor dhows. Gunboats and patrol vessels are for customs work.

Peru.—Almirante Grau and Coronel Bolognesi, cruisers 3200 tons; (Barrow, 1906); two 6-in., eight 3-in., eight maxim; 2 submerged torpedo tubes; 24 knots; converted to oil-burning 1925, to be fitted as minelayers; also Lima (1880, refitted 1920) (parent ship for submarines), 1790 tons, 10 knots, four 4-in. Gunboat America, 200 tons, 14 knots. Destroyer, Rodriguez, 500 tons, 28 knots. T.B.D.s Lennuk (1917), 1400 tons, 35 knots, five 4-in. guns, one 2-pr., nine T.T., eighty mines, and Vambola (1918), 1260 tons, 35 knots, four 4-in. guns, two M., one 2-pr., nine T.T., eighty mines, have recently been purchased from Esthonia, and have been renamed Almirante Guise and Almirante Villar respectively Submarines R1–4, built in U.S.A. (1926–9), and R5 and R6 authorised, $\frac{576}{682}$ tons, $\frac{14\frac{1}{2}}{10}$ knots, one 3-in., 4 torpedo tubes. One vedette boat, the Napo, 98 tons, built by Yarrow, 1921, three 1·8-in. Two destroyers are projected. Two river gunboats of 250 tons are building at New Jersey, for service on the Amazon.

Poland.—Five *ex*-German torpedo boats (355 tons, 20 knots, two 3-in., 18-in. torpedos) for police purposes. Gunboats Komendant Pilsudski and General Haller, 350 tons, 14 knots, built in Finland (1920). Training ship Iskra. Monitors Warszawa, Horodyszcze, Krakow, Wilno, Torun, Pinsk. Twenty motor boats. Two destroyers, Burza, Wicher, completed 1931–2 at Chantiers Navals Français, 1515 tons, 33,000 H.P., 33 knots, four 5·1-in., one 2·9-in. A.A., 6 torpedo tubes. Three submarine minelayers built in France, Rys, Zbik, and Wilk, completed 1931–2; $\frac{964}{1230}$ tons, $\frac{1800}{1200}$ H.P., 14 knots surface, 9 knots submerged; one 4-in., one 2-pr., 6 torpedo tubes, 40 mines. Minesweepers Jas Kolka, Mewa, Czajka, Rybitwa (1935), 350 tons, 1040 H.P. (Diesels), 15 knots, one 3-in. gun. A minelayer, Gryf, 2200 tons, 6000 H.P. (I.C.), 20 knots, six 4·7 in., two 3·5 in. A.A., two machine-guns, is building in France. Two destroyers, building by Messrs. J. G. White, of Cowes, laid down July, 1935, 2000 tons, 39 knots, seven 4·7-in., 2 triple torpedo tubes. A submarine minelayer is projected.

Portugal.—The minelayer Vulcano (151 tons) (Thornycroft, 1909). Two sloops, about 1200 tons, sold out of the British Navy, Carvalho Araujo (*ex*-Jonquil) and Republica (*ex*-Gladiolus), two 4-in., two 3-in. A.A. Coast defence vessel Vasco da Gama (1876, reconstructed 1903), 3030 tons, 15·5 knots, two 8-in., one 6-in., one 3-in. Understood to be disarmed. Destroyers Tamega, Guadiana (1913–24), 700 tons, 11,000 H.P., 27 knots, one 4-in., two 3-in., two torpedo tubes. Gunboats Damao and Zaire (1919), Diu and Lagos (1932), 400 tons, 700 H.P., 13 knots, two 3-in., two 3-pr., and there are 18 older ones.

1st class sloops: Alfonso de Albuquerque and Bartolomeu Diaz (Hawthorn Leslie, 1935), 1760 tons, 21 knots, four 4·7 in., two 3-in.

A.A., four pom poms, two torpedo tubes, one catapult, and 40 mines. 2nd class sloops: Goncalo Velho and Goncalves Zarco (Hawthorn Leslie, Newcastle, 1933), 1045 tons, 16 knots, three 4·7-in., two pom poms. Pedro Nunes, completed 1933, and Infante Henrique (building at Lisbon), 1080 tons, 17 knots, two 4·7-in. Destroyers: Vouga and Lima (Yarrow's, Scotstoun, 1933), and Dao and Tejo (built by Yarrow's in Portugal, 1935), 1280 tons, 33,000 H.P., 36 knots, four 4·7-in., three 1·5-in A.A., two quadruple 21-in. torpedo tubes. Submarines: Delfin, Espardate, and Golfinho (Vickers, 1934–1935); surface condition, 800 tons, 2300 H.P. and 16½ knots; submerged condition, 1000 tons, 1000 H.P. and 9¼ knots; one 4-in. gun, six 21-in. torpedo tubes.

Two destroyers, Douro and Tejo, sister vessels to Dao, were bought by the Colombian Government and renamed Antoquia and Caldas (see Colombia), and replace vessels were ordered from the Society of Constructions and from Naval Repairs Co., Lisbon; engines, boilers and all material supplied by Yarrows.

Other ships, including two light cruisers and an aircraft tender are projected.

Rumania.—*River Monitors.*—Bucovina (1916), 540 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Ardeal (1905), 440 tons, 10 knots, two 4·7-in., one 3-pr., one 3·5-in. A.A.; Basarabia (1915), 530 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Lascar Catargiu, Ioan Bratianu, Milhail Kogalniceanu, Alexandru Lahovari (1907–08), 670 tons, 13 knots, three 4·7-in., two 3-pr., one 3-in. A.A., 2 M.

Flotilla Leaders.—Regele Ferdinand and Regina Maria (Naples, 1930, Thornycroft's design), 1785 tons, 38 knots; length 334¾ ft.. five 4·7-in., three 2-pr. A.A.; two twin torpedo tubes. Marasti, Marasesti (*ex*-Italian Nibbio, Sparviero), 1917–18, 1460 tons, 35 knots, five 4·7-in., four 3-in. A.A., 2 M., 2 twin torpedo tubes, 50 mines.

Four vedettes (built in 1908), 50 tons, 18 knots, one 3-pdr. gun.

Gunboats.—Stihi, Lepri Remus, Dumitrescu, Ghiculescu (1916–17, *ex*-French Magnonne, Friponne, Chiffonne, Impatiente), 350 tons, 15 knots, two 3·9-in., 2 M.

Submarine.—Delphin (Quarnaro, Fiume, 1932). Displacement, 640 tons surface, 817 tons submerged; speed 14 knots surface, 9·5 knots submerged, one 4·2-in. gun, 6 torpedo tubes. This vessel, laid down in 1927, has not yet been taken over by Roumania.

There are also five armed motor boats, police craft (*ex*-Austrian T.B.s) Naluca, Sborul, and Zmeul, and seven armed launches.

A submarine depôt ship, Constanta, 1821 tons, two 4-in. A.A. guns (Fiume 1930).

Training ship, Nircea, 350 tons, 8·5 knots, two 1-pr. Sailing with auxiliary engines.

Siam.—*Gunboats:* Ratnakosindr (1925), 920 tons, two 6-in., four 3-in. H.A., 12 knots; Bali and Sugrib (1900), 580 tons, 11·5 knots, one 4·7-in., five 6-pr., 2 M.; Sukhodaya (Vickers, 1930), 1030 tons, 13 knots, two 6-in., four 3-in. A.A. Two 380-ton, 27-knot destroyers, built at Kobe, Sua Gamron Sindhu and Sua Tayanchor. Phra Ruan (*ex*-British Radiant, 1917), 719 tons, 35 knots, three 4-in. Four torpedo boats (built in Japan, 1908–13), 90 tons, 22 knots, one 6-pr., one 3-pr. Six 55-ft. Thornycroft C.M.B.s. Two torpedo boats under construction in Italy (400 tons). Training ship Chao Phra (1919), 840 tons, 16 knots. Six submarines and four torpedo boats are projected.

Turkey.—The old battleship Torghud Reis (*ex*-German Weissenburg, 1891), refitted 1927, 9842 tons, 17 knots, six 11-in., three 3-in., two 2·5-in. A.A., 2 submerged torpedo tubes. The battle-cruiser Yavouz Sultan Selim (1912) (*ex*-Goeben), 22,734 tons, 27 knots. Armament: ten 11-in., ten 5·9-in., eight 3·5-in., four 1·5-in. P.P., 2 M., 1 L., 4 submerged torpedo tubes. Light cruisers: Hamidieh (Elswick, 1904), 3830 tons, speed 22 knots; armament: two 5·9-in., six 3-in., eight 3-in. A.A., two 18-in. torpedo tubes; Medjidieh (Philadelphia, 1903), refitted 1927, 3300 tons, speed 22 knots, armament: four 5·1-in., two 3-in. A.A., 4 M. Destroyers: Adatepe, Kocatepe (Ansaldo, Italy, 1932), 1310 tons, 43 knots, four 4·7-in., three 2-pr. A.A. guns, six 21-in. tubes. Tinaztepe and Zafer (Cantiere Navale del Tirreno, Italy, 1932), 1840 tons, 38 knots, four 4·7-in. guns, three 2-pr. A.A., six 21-in. tubes. Submarines Ikindji-in-Uni and Birindjiin-Uni (Fijenoord, Rotterdam, 1928), $\frac{433}{556}$ tons, $\frac{13\frac{3}{4}}{9\frac{3}{4}}$ knots, one 3-in., 1 M., six 18-in. torpedo tubes. Dumlupinar (minelayer), (Monfalcone, 1932), 950 tons, 15 knots, 2400 H.P. surface, 1200 tons, 9½ knots, 1400 H.P. submerged, one 4-in. A.A., 4 torpedo tubes, 40 mines. Sakarya (Montfalcone, 1932), $\frac{935}{1220}$ tons, 15 knots 1500 H.P. surface, 925 tons, 9 knots, 1100 H.P. submerged, one 4-in, six 21-in. torpedo tubes. Seven motor launches. Reported that two 10,000-ton cruisers, two destroyers, and 4 submarines are to be built in Japan. Ten new submarines projected.

Uruguay.—Torpedo-gunboat (training ship) Uruguay (1910), 1150 tons; two 4·7-in., four 3-in.; two 18-in. torpedo tubes. Surveying ship Capitan Miranda (1930), 540 tons. Gunboat Rio Branco. Training ship, 18 de Julio, 680 tons, 12 knots. Three coastguard cutters, 150 tons, 16 knots, building in Italy.

Venezuela.—Old gunboats Mariscal Sucre (1125 tons), two 4-in., two 6-pr. General Salom (750 tons), one 3-in., four 6-pr., 12 knots. Miranda (200 tons), Brion (150 tons). Armed tug José Felix Ribas, two 6-pr. Armed yacht Maracay.

Yugoslavia.—Submarines Hrabri and Nebojsca, completed at Armstrong's 1928, displacement 870 tons surface, 1146 tons submerged; speed 15 knots surface, 10 knots submerged; mount two 4-in., six 21-in. torpedo tubes. Smeli and Osvetnik, completed at Nantes, 1929; displacement 570 tons surface, 797 tons submerged, speed 14·5 knots surface, 9·25 knots submerged, carry one 4-in., one 2-pr., and 6 torpedo tubes (21-in.). Two coastal motor boats, 38 knots, built at Thornycroft's, completed in 1927. Old cruiser Dalmacija (*ex*-German Niobe), refitted 1926, 2600 tons, six 3-in., is used as a gunnery and general training ship. There are four *ex*-Austrian river monitors, Vardar, Drava, Sava, Morava, 400–530 tons, mounting two 4·7-in. and smaller guns; eight *ex*-Austrian T.B.'s; two patrol boats; six mine-layers (*ex*-German, 1918), 330–512 tons, 15 knots, two 3·9-in., 40 mines; six mine-sweepers; one seaplane depôt ship, Zmaj (built at Hamburg, 1929), 1870 tons; one training ship; two submarine depôt ships (1895), and auxiliary craft.

One flotilla leader, Dubrovnik, built at Yarrow's, Scotstoun, completed 1932, length 371 feet, displacement 1880 tons, 42,000 S.H.P., speed 37 knots, carries four 5·5-in., 2 twin 2-pr., 2 triple 21-in. torpedo tubes, and 40 mines.

Two flotilla leaders and six torpedo boats are projected.

BRITISH AND FOREIGN FLOTILLAS.

Great Britain.

Name or Number.	Built by.	Completed.	Dimensions. Length (Extreme).	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
			Flotilla Leaders.										
			ft. ins.	ft. ins	ft. ins.		Tons.		Knots.				Tons.
Tribal Class:													
Afridi	Vickers-Armstrongs	Bldg.	..	..	..	..	1850	..	..	..	..	..	..
Cossack													
Ghurka	Fairfields												
Maori													
Mohawk	Thornycroft												
Nubian													
Zulu	Stephen & Sons												
Inglefield	Cammell Laird	Bldg.	..	..	..	..	1455	38,000	36	5 4·7-in. 2 ·5-in. M. ·5 smaller.	2 Q. 21"	..	490
Hardy													
Grenville	Yarrow	Bldg.	330	34 6	8 0	..	1460						
Faulknor	Yarrow	Bldg.	343	33 9	8 8	2	1475	38,000	36				
Exmouth	Portsmouth Dockyard	1934											
Duncan	Portsmouth Dockyard	1933	329	33 0	8 8	2	1400	36,000	35½	4 4·7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q.	..	470
Kempenfelt	J. S. White	1932	329	33 0	8 7	..	1390	36,000	35½			..	470
Keith	Vickers	1931	323	32 3	8 6	2	1400	34,000	35	4 4·7 in., 2 2-prs. 1 M., 4 L.	2 Q.	..	380
Codrington	Swan Hunter	1930	343	33 9	10 0	2	1540	39,000	35	5 4·7-in., 2 2-prs., 1 M., 4 L.	2 Q. 21"	..	425
†Abdiel	Cammell Laird	1916	325	31 9	11 3	3	1310	36,000	34	3 4-in., 1 2-pr., 1 M., 4 L., Mine-layer.	—	130	515
†Shakespeare	Thornycroft	1917	329	31 11	12 4	2	1480	40,000	36	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T. 21"	182	500
†Spenser	,,	1917											
Wallace	,,	1919											
Keppel	,,	1925											
Broke, *ex*-Rooke	,,	1925											
Bruce	Cammell Laird	1918	332 6	31 9	12 3	2	1530	40,000	36·5	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T. 21"	182	500
Douglas		1918											
Campbell		1918											
Mackay, *ex*-Claverhouse		1919											
Malcolm		1919											
Montrose	Hawthorn Leslie	1918											

† Due to be prepared for sale.

DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
Intrepid, Hero, Greyhound, Fearless, Eclipse, Defender, Crusader, Beagle, and Acasta Classes:			Feet.	ft. ins	ft. ins.		Tons.		Knots.				Tons.
Icarus	J. Brown	Bldg.	..	..	..	..	1350	..	..	4·7-in guns	..	..	-
Ilex													
Isis	Yarrow												
Ivanhoe													
Imogen	Hawthorn Leslie												
Imperial													
Intrepid	J. S. White												
Impulsive													
Hero	Vickers (Parsons)	Bldg.	323	33 0	8 6	2	1350	34,000	35½	4 4·7 in. 7 smaller	2 Q. 21"	..	460
Hereward													
Hostile	Scotts												
Hotspur													
Hasty	Denny												
Havock													
Hunter	Swan Hunter												
Hyperion													
Greyhound	Vickers-Armstrong	Bldg. (est. 1936)	323	33 3	8 6	2	1350	34,000	35½	4 4·7-in. 2 ·5-in. M. 5 smaller	2 Q. 21"	..	..
Griffin													
Garland	Fairfields												
Gipsy													
Gallant	Stephen & Sons												
Grenade													
Grafton	Thornycroft												
Glowworm													

Torpedo tubes: T. = triple Q. = quadruple.

Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions. Length (extreme).	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Fearless ..	Cammell Laird	..	..	..	..	..	1375						
Foresight ..													
Foxhound ..	Brown	1935	329	33 3	8 6	2	1350	36,000	35½	4 4·7-in. 2 ·5-in. M. 5 smaller.	2 Q. 21″	..	480
Fortune .													
Forester ..	J. S. White												
Fury . ..													
Fame ..	Parsons/Vickers-Armstrong												
Firedrake ..													
Eclipse	Denny ..	1934	329	33 3	8 6	2	1375	36,000	35½	4 4·7-in. 2 ·5-in. M. G. 5 smaller.	2 Q. 21″	..	480
Echo													
Escapade ..	Scotts ..												
Escort ..													
Electra ..	Hawthorn Leslie												
Encounter ..													
Esk	Swan Hunter												
Express ..													
Defender ..	Vickers-Armstrong	1932—1933	317¾ (b.p.)	33	8 6	2	1375	35,000	35½	4 4·7-in. 1 3-in. A.A. 7 smaller	2 Q. 21″	..	470
Diamond ..													
Daring ..	Thornycroft												
Decoy ..													
Dainty ..	Fairfield ..												
Delight ..													
Diana ..	Palmers ..												
Duchess ..													
Crusader ..	Portsmouth Dockyard	1932	317¾ (b.p.)	33	8 6	2	1375	36,000	35½	4 4.7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q. 21″	..	470
Comet ..													
Cygnet ..	Vickers-Armstrong												
Crescent ..													
Basilisk	Brown ..												
Beagle	,, ..	1931	323	32¼	8½	2	1360	34,000	35	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 Q 21″	140	390
Blanche	Hawthorn, Leslie												
Boadicea	,, ,,												
Boreas	Palmers ..												
Brazen	,, ..												
Brilliant	Swan, Hunter												
Bulldog	,, ,,												
Acasta	Brown ..	1930	323	32¼	8¼	2	1350	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q. 21″	140	390
Achates	Brown ..	1930											
Acheron	Thornycroft	1931											
Active	Hawthorn Leslie	1930											
Antelope	Hawthorn Leslie	1930											
Anthony	Scotts ..	1930											
Ardent	Scotts ..	1930											
Arrow	Vickers-Armstr.	1930											
Thornycroft Type:													
Amazon	Thornycroft ..	1927	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 T. 21″	140	433
Yarrow Type:													
Ambuscade.. ..	Yarrow	1927	322	31	8¼	2	1170	33,000	37		2 T. 21″	140	385
Admiralty "S" Class:													
Sabre..	Stephen	1918	276	26¾	10⅝	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21″	103	301
Shamrock	Doxford	1919											
Saladin	Stephen	1919											
Sardonyx	,, ...	1919											
Scimitar	Brown	1918											
†Seafire	,, ...	1918											
Searcher	,, ...	1918											
†Serene	,, ...	1919											
Spindrift	Fairfield	1919											
Turbulent	Haw. Leslie ..	1919											
Tenedos	,, ...	1919											
Thanet	,, ...	1919											
Thracian	,, ...	1922											
Stronghold	Scott	1919											
Sturdy	,, ...	1919											
Sportive	Swan Hunter ..	1918											
Swallow	Scott	1918											
Trojan	J. S. White ..	1918											
Trusty	,, ,, ..	1919											
†Senator	Denny	1918											
Scout	Brown	1918											
Scotsman	,, ...	1918											
Shikari	Doxford Chatham ..	1924											

† Due to be prepared for sale. Torpedo tubes: D = double. T. = triple. Q. = quadruple.

Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel.
			Length. (Extreme)	Beam.	Draught.								Oil.
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Admiralty "V" Class:													
Vansittart	Beardmore ..	1919	312	29½	10⅝	2	1120	27,000	34	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130	367
Venomous	Brown	1919											353
Verity	,, ...	1919											363
Volunteer	Denny	1919											370
Veteran	Brown	1919											363
Wanderer	Fairfield ..	1919											367
Wren	Yarrow	1923	312	29½	10⅝	2	1120	27,000	34				370
Whitshed	Swan Hunter ..	1919											368
Wild Swan	,, ,, ..	1919											368
Witherington ..	J. S. White ..	1919											365
Wivern	,, ,, ..	1919											365
Wolverine	,, ,, ..	1920											365
Worcester	,, ,, ..	1922											365
Whitehall	Swan Hunter Chatham	1925											365
Walpole	Doxford ..	1918	312	29½	10⅔	2	1100	27,000	34	4 4in., 1 2-pr., 1 M., 4 L.	2 T.	120	367
Whitley	,, ..	1918											
Wryneck	Palmer ..	1918											
Windsor	Scott	1918											
Wrestler	Swan Hunter ..	1918											
Wessex	Haw. Leslie ..	1918	312	29½	10·7	2	1100	27,000	34				369
Winchester ..	J. S. White ..	1918											369
Wolfhound	Fairfield ..	1918											369
Westminster ..	Scott	1918	312	29½	10·7	2	1100	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	2 T. 21"	120	
Westcott	Denny	1918											367
Wakeful	Brown	1917											
Walker	Denny	1918											
Walrus	Fairfield ..	1918											
Warwick	Haw. Leslie ..	1918											
Watchman	Brown	1918											
Whirlwind	Swan, Hunter ..	1918											
Winchelsea	J. S. White ..	1918											
Vanessa	Beardmore ..	1918	312	29½	10⅝	2	1090	27,000	34				
Vanity	,, ..	1918											
Vidette	Stephen ..	1918											
Vivien	Yarrow ..	1918											
Valentine	C. Laird ..	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120	369
Valkyrie	Denny	1917											
Valorous	,, ...	1917											
Vimy (*late* Vancouver)	Beardmore ..	1918								4 4-in., 1 2-pr., 1 M., 4 L.	1 T. 1 D.		370
Vanoc	Brown .. .	1917								4 4-in., 1 2-pr., 1 M., 4 L.	3		
Vanquisher ..	,, ...	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.		
Vectis	J. S. White ..	1917											
Vega	Doxford ..	1917											
Velox	,, ..	1918									1 T., 1 D.		
Venetia	Fairfield ..	1917									2 T.		
Venturous	Denny	1917											
Verdun	Haw. Leslie ..	1917											
Versatile	,, ..	1918	..	..	..	..	..	..	..		1 T., 1 D.	120	
Vesper	Stephen ..	1918								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.		
Vimiera	Swan Hunter ..	1917											
Violent	,, ,, ...	1917											
Vivacious	Yarrow ..	1917									1 T. 1 D.		
Vortigern	J. S. White ..	1918											
Thornycroft "V" Class:													
Witch	Thornycroft Devonport	1924	312	30¾	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130	374
Wishart	Thornycroft ..	1920											
Woolston	,,	1918	312	30¾	10¼	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120	
Wolsey	,,												
Viceroy	,,												
Viscount	,,												
Admiralty "R" Class:													
Tempest	Fairfield ..	1917	276–276¼	26¾	10⅔	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	98	296–298
†Thisbe	Haw. Leslie ..	1917											
Thruster	,, ..	1917											
Torrid	Swan Hunter ..	1917											
Skate	Brown	1917											
Rowena	,, ...	1916											
Restless	,, ...	1916											
Sable	H. & Wolff ..	1916											
Yarrow "R" Class;													
Tyrant	Yarrow ..	1917	271½	25¾	9½	2	760	23,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	98	256

† Due to be prepared for sale.

Great Britain—*continued.*

SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions. Length. (Extreme)	Dimensions. Beam.	Dimensions. Draught.	No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Triton Class:													
Triton	Vickers-Armstrong	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Thames Class:													
Thames ..	Vickers-Armstrong	1932	345	28	13·5	..	1,805/2,680	10,000/2,500	21¾/10	1 4-in., 2 smaller	6	..	224
Severn ..	Vickers-Armstrong	1935	345	28	13·7	..	1,850/2,710	10,000/2,500	22½/10		..	..	210
Clyde													
Porpoise Class:*													
Porpoise ..	Vickers-Armstrong	1933	289	29·8	13·8	..	1,500/2,060	3,300/1,630	15/8¾	1 4-in., 2 smaller	6	..	155
Grampus ..	Chatham ..	Bldg.											
Narwhal ..	Vickers ..	1935	..	..	..	..	..	..	..	—	..	..	..
Rorqual ..													
Cachalot ..	Scott's ..	Bldg.											
Swordfish Class:													
Starfish ..	Chatham ..	1933	202·5	24	10·5	..	640/935	1,550/1,300	13¾/10	1 3-in., 1 smaller	6	..	44
Seahorse ..													
Swordfish ..													
Sturgeon ..													
Sealion ..	Cammell Laird	1934	208·7	24	10·5	..	670/960	1,550/1,300	13¾/10		6	..	..
Salmon ..		1935											
Shark	Chatham ..	1934											
Snapper ..		1935											
Seawolf ..	Scott's ..	Bldg.											
Sunfish ..	Chatham ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Spearfish ..	Cammell Laird												
Sterlet.. ..	Chatham ..												
Rainbow Class:													
Rainbow ..	Chatham ..	1932	290	29·8	13·8	..	1,475 2,015	4,400/1,320	17½/9	1 4-in. (Perseus has 1 4·7 in.)	8	53	156
Regent ..	Vickers-Armstrong	1930											
Regulus ..		1930											
Rover .		1931											
Parthian Class:													
Parthian ..	Chatham ..	1931	290	29·8	13·7	..	1,475/2,040						
Perseus ..	Vickers-Armstrong ..	1930											
Proteus ..													
Pandora ..													
Phœnix ..	Cammell Laird	1931											
Odin Class:													
Odin	Chatham ..	1929	283½	29·8	13·7	..	1,475/2,030	4,400/1,320	17½/9	1 4-in., 2 Lewis	8	53	174
Olympus ..	Beardmore ..	1930											
Orpheus ..	Beardmore ..	1930											
Osiris	Vickers ..	1929											
Oswald ..	Vickers ..												
Otus	Vickers ..												
Oberon Class:													
Oberon ..	Chatham ..	1927	270	28	13·2	..	1,311/1,830	2,950/1,350	15/9	1 4-in., 2 Lewis	8	53	185
Oxley ..	Vickers ..	1927	275	27·7	13·3	..	1,350/1,870	3,000/1,350	15½/9	1 4-in., 2 Lewis	8	53	195
Otway ..													
X Type:													
X1	Chatham ..	1925	363½	29·8	15·3	..	2,425/3,600	7,000/2,600	19½/9	4 5·2 in., 2 Lewis	6	100	450
L 50 Class:													
L71	Scott's ..	1920	235	23·5	12	..	845/1,150	2,400/1,600	17½/10½	1 4-in., 1 Lewis	6	44	110
L69 .. .	Beardmore ..	1923											
L56 .. .	Fairfield ..	1919								1 4-in., 1 Lewis			
L54	Denny ..	1924											
L53	Armstrong ..	1925								2 4-in., 1 Lewis			
L52	Armstrong ..	1921											
L Class:													
L27	Vickers ..	1926	238½	23½	11·7	..	760/1,080	2,400/1,600	17½/10½	1 4-in., 1 Lewis (L25 carries 14 mines in addition)	4	41	76
L26	Vickers ..	1926											
L23	Vickers ..	1924											
L21	Vickers ..	1920											
L19	Vickers ..	1919											
†L18	Vickers ..	1919											

* Minelaying submarines.

† Due to be prepared for sale.

Great Britain—*continued.*

SUBMARINES—*continued.*

Name or Number.	Where Built.	Completed	Dimensions. Length. (Extreme)	Beam.	Draught.	No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity. Oil.
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
H Class:													
H50	Beardmore ..	1920	171	15·75	12·5	..	410 500	480 320	13 10½	1 Lewis	4	23	16
H49	Beardmore ..	1919											
H44	Armstrong ..	1920											
H43	Armstrong ..	1919											
H34	Cammell Laird	1919											
H33	Cammell Laird	1919											
H32	Vickers ..	1919											
H31	Vickers ..	1919											
H28	Vickers ..	1918											

SLOOPS

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement.
		ft. ins.	ft. ins.	ft. ins.									
SLOOPS.													
Convoy Sloops:													
‡Enchantress	1190	282	37 0	8 6	3,300	J. Brown	J. Brown	..	Bldg.	4·7-*in.* guns.	18	— 370	..
*Stork . .	1180	282	37 0	8 6	3,300	Denny	..	..	Bldg.	1 small gun	18	— 320	..
Bittern .													
Coastal Sloops:													
Kingfisher	535	234 b.p.	26 6	6 6	3,600	Fairfield	Fairfield	1935	1935	1 4-*in.* gun. 8 smaller	20	— 160	..
Mallard .	..	..	..	..	..	Stephen	..	..	Bldg.	..	..	..	..
Puffin . .													
Sheldrake .	..	..	..	..	..	Thornycroft	..	..	Bldg.	..	..	..	..
Kittiwake.													
Grimsby Class:													
Grimsby .						Devonport		1933	1934	2 4·7-*in.* guns. 1 3-*in.* 12 smaller			
Leith .						Devonport							
Lowestoft .	990	266	36 0	7 6	2,000	Devonport	J. S. White						
Wellington						Devonport		1935	1935				
Londond'ry						Chatham		1934	1935		16½	— 280	..
Deptford .													
Aberdeen .	1060	..	.	..	..	Devonport	Thornycroft	1935	Bldg.	3 4-*in.* 12 smaller			
Fleetwood .						Devonport				4 4-*in.* 12 smaller			
SLOOP MINE-SWEEPERS.													
Halycon Class:													
Halcyon .	..	..	..	..	..	J. Brown	J. Brown	1934	1934				
Skipjack .	815†	246	33 6	7 3	1,770					1 4-*in.*, 1 4-*in.* A.A. 1 2-*pr.*	16½ est.	220	..
Harrier .						Thornycroft	Thornycroft						
Hussar .	..	..	..	..	..			1935	Bldg.				
Speedwel						Hamilton	Beardmore						
Niger . .	875	246	33 6	7 7	8,000	J. S. White	J. S. White	1935	Bldg.	2 4-*in.* 9 smaller	..	..	..
Salamander													
Hebe . .						Devonport							
Sharp-shooter	..	..	..	..	..	..	..	..	..	..	..	..	..
Hazard .													
*Gleaner .	..	..	..	..	..	Wm. Gray	..	..	..	..	..	..	..

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* Will be employed as surveying vessel and will carry 1 small gun only.

‡ In addition to her normal duties Enchantress will be made available for occasional use by the Board of Admiralty.

Great Britain—*continued.*

SLOOPS.—*continued.*

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where Built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement.
		ft. ins.	ft.ins.	ft. ins.									
Shoreham Class : Repeat Shoreham Class :													
Falmouth.	1105 †	281 4	35 0	8 3	2,000 P.T. (G.)	Devonport	Hawthorn Leslie	1932	1932	1 *4-in.*, 1 *4-in.* A.A. 4 *3-pr.* 8 L.	16–16½	— 290	..
Milford .							Yarrow						
Weston .							Yarrow		1933				
Dundee .						Chatham	Hawthorn Leslie						
Bideford .	1105*	281 4	35 0	8 0	2,000 P.T. (G.)	Devonport	J. S. White & Devonport	1931	1931	1 *4-in.*, 1 *4-in.* A.A. 4 *3-pr.* 8 L.	16–16½	— 290	..
Rochester.						Chatham	J. S. White & Chatham	1932	1932				
Fowey .						Devonport	J. S. White & Devonport	1930	1931				
Shoreham.						Chatham	J. S. White & Chatham	1930	1931				
Hastings Class :													
Hastings .	1025	266 4	34 1	9 1	2,000 P.T. (G.)	Devonport	Devonport	1930	1931	1 *4-in.*, 1 *4-in.* A.A. 2 *3-pr.* 8 L.	16–16½	— 280	..
Penzance .						Devonport	Devonport	1930	1931				
Folkestone	1045					Swan, Hunter	Hawthorn, Leslie	1930	1930				
Scarborough						Swan, Hunter	Hawthorn, Leslie	1930	1930				
Bridgewater Class :													
Bridgewater	1045	266 4	34 0	8 6	2.000 P.T. (G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1 *4-in.*, 1 *4-in.* A.A., 4 L.	16–16½	— 275	95
Sandwich													
Anchusa Class :													
Harebell‡ .	1345	274 9	35 0	12 0	2,500 recip.	Barclay Curle	Barclay Curle	1918	1918	2 *4-in.* 2 *12-pr.*, 2 L.	16·5	320 —	119
Chrysanthemum	1345	276 0	35 0	13 3	2,500 recip.	Armstrong	Wallsend Slipway	1917	1918	2 *3-pr.*	16·5	260 —	100
Bryony .	1345	275 3	35 0	12 10	2,500 recip.	Armstrong	Wallsend Slipway	1917	1917	1 M., 8 L.	16·5	260 —	70
Arabis Class :													
Godetia‡ .	1175	267 9	33 6	12 0	2,000 recip.	C. Connell	Rowan	1916	1916	1 *4-in.*, 1 *12-pr.* 2 L.	16–17	255 —	100
Lupin† .						Simons	Simons	1916	1916	2 *4-in.*, 4 *3-pr.*, 1 *2-pr.*, 8 L.		— 182	
Rosemary						Richardson Duck	Blair	1915	1916	1 *4-in.*, 2 *2-pr.* 2 M., 8 L.		260 —	
Acacia Class :													
Foxglove .	1165	262 6	33 0	12 6	1,800 recip.	Dunlop Bremner	Dunlop Bremner	1915	1915	2 *4-in.*, 4 *3-pr.* 2 *2-pr.*, 8 L.	16–17	250 —	100

† Converted to oil-burning. **‡ Fishery protection ships.**

Great Britain—*continued.*

TWIN-SCREW MINESWEEPERS, RIVER GUNBOATS.

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. / Oil.	Complement.
TWIN-SCREW MINE-SWEEPERS.													
Aberdare	710	231 0	28 7	9 0	2,200 recip.	Ailsa	Ailsa	1918	1918	1 *4-in.*, 1 *12-pr.* A.A. Alresford, Caterham, Ross and Saltburn no armament.	16	186 / —	73
Abingdon						Ailsa	G. Clark						
Albury						Ailsa	Ailsa	1918	1919				
Alresford						Ailsa	W. H. Allen	1919	1919				
Bagshot						Ardrossan Dry Dock Co.	W. H. Allen	1918	1919				
Derby						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918				
Dundalk						Do.	Do.						
Dunoon						Do.	Do.						
Fermoy						Dundee S.B. Co.	Cooper & Greig	1919	1919				
Fareham						Dunlop, Bremner	Dunlop, Bremner	1918	1918				
Tiverton						Simons	Simons	1918	1918				
Elgin						Do	Do.						
Sutton						McMillan	Yarrow	1918	1919				
Saltash						Murdock & Murray	Do.						
Saltburn						Do.	Do.						
Selkirk						Do.	D. Rowan	1918	1919				
Ross						Lobnitz	Lobnitz	1919	1919				
Widnes						Napier & Miller	Rowan	1918	1918				
Harrow						Eltringham	Wallsend Slipway						
Huntley						Do.	Eltringham	1919	1919				
Lydd						Fairfield	Fairfield	1918	1919				
Stoke						C. Rennoldson	Shields Eng. Co.	1918	1918				
Pangbourne						Lobnitz	Lobnitz						
Tedworth	675	231 0	28 0	9 0	1,800 recip.	Simons	Simons	1917	1917	1 *3-in.* A.A.	14	140 / —	35
RIVER GUN-BOATS.													
Robin	226	150 b.p.	26 8	3 0	800 recip.	Yarrow	Yarrow	1934	1934	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	12¾	— / 140	
Sandpiper	185	160 0 b.p.	30 8	1 10	600 recip.	Thornycroft	Thornycroft	1933	1933	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	11½	— / 28	
Falcon	372	150 0	28 8	4 9	2,250 (G.)	Yarrow	Yarrow	1931	1931	1 *3·7-in.* Howitzer, 2 *6-pr.*, 8 L.	15	— / 84	
Gannet	310	185 0	29 0	4 0	2,250 (G.)	Yarrow	Yarrow	1927	1928	2 *3-in.* A.A., 8 L.	16	— / 60	60
Peterel								1927	1927				
Seamew	262	168 0	27 0	4 0	1,370 (G.)	Do.	Do.	1928	1928		14	— / 50	60
Tern								1927	1927				
Aphis	625	237 6	36 0	4 6	2,000 recip.	Ailsa	Ailsa	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.	14	— / 100	55
Bee						Do.	Do.	1915	1916	1 *3-in.* A.A., 2 *3-pr.*, 1 *2-pr.*, 8 L.			
Cicala						Barclay Curle	Barclay Curle	1915	1916	2 6-in., 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		35 / 55	
Cockchafer						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 8 L.			
Cricket						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		— / 100	
Gnat						Lobnitz	Lobnitz	1915	1915				
Ladybird						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* AA., 1 *2-pr.*, 8 L.			
Mantis						Sunderland S.B. Co.	N.E. Marine	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		35 / 55	
Moth						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		— / 80	
Scarab						Wood, Skinner	Do.	1915	1915			— / 105	
Tarantula						Do.	Do.	1915	1916	1 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.* 8 L.		— / 105	

Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
FLOTILLA LEADERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Cervantes (*ex*-Spanish Churruca) Juan de Garay (*ex*-Spanish Alcala Galiano)	Cartagena ..	1925	331⅜	31⅜	10½	2	1650	42,000	36	5 4·7 in., 1 3-in. A.A., 4 M.	2 triple 21-in.	—	—/540
Mendoza .. La Rioja .. Tucuman ..	J. S. White, Cowes	1928 1929 1929	318¼	31·8	12¾	2	1520	45,000	36 (La Rioja 39·4 *t.*)	5 4·7 in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	—/700
DESTROYERS—													
Catamarca * .. .. Jujuy †	Schichau .. Germania ..	1911	288·7	27¼	10	2	972	18,000	32	3 4-in. 2 1-pr.	4 21-in.	100	—
Cordoba * .. .. La Plata †	Shichau .. Germania ..	1910 1911	295¼	29·5	10	..	1000	28,000	34·7 *t.*			100	—
SUBMARINES—													
Santa Fe .. .. Salta .. .. .. Santiago del Estero	Taranto ..	1931 1932 1933	226¾	21¼	13	2	850/1080	3,000/1,300	17·5/9	1 4·7-in. 1 2-pr. A.A.	8 21-in.	41	—

* Converted to oil-burning, 1927, at Buenos Aires. † Converted to oil-burning at Buenos Aires.

3 flotilla leaders and 3 submarines are projected.

Brazil.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Para .. .. .. Piahuy .. .. .. Matto Grosso .. .. Parahyba.. .. .. Rio Grande del Norte Alagoas .. .. .. Santa Catharina .. Parana .. .. .. Sergipe	* Yarrow ..	1908 1908 1908 1909 1909 1909 1909 1910 1909	240 p.p.	23·6	7·5	2	560	8,000	27 (27·1–28·7 on trials)	2 4-in., 4 3 prs.	2 18-in.	75	140/—
Marauhao (*ex*- Porpoise)	Thornycroft..	1913	265·3	26·5	10	..	934	22,500	31	3 4-in., 1 2-pr.	2 dble. 21-in.	..	—/250
SUBMARINES—													
Humayta	Spezia (Ansaldo Fiat)	1927	282	25·6	14	2	1450/1884	4,800/2,200	18·5/10	1 4-in. A.A.; carries mines	6 21-in.	55	—/140
F 1 .. .. F 3 .. .. F 5	Spezia (Fiat)	1913	150	13·8	12	..	250/370	700/500	13·5/8	—	2 18-in.	..	..

* In bad condition.

9 destroyers of 1,600 tons, 6 submarines of 1,003 tons, and 6 submarines of 800 tons are approved to be built in eight years. Orders have not yet been placed, except for three destroyers to be built at the naval dockyard on the Ilha das Cobras.

Chile.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Serrano .. .. Orella .. .. .. Riquelme .. .. Hyatt .. .. .. Videla .. .. .. Aldea	Thornycroft's	1928	300	29	9	2	1090	28,000	35	3 4·7-in., 1 3-in.	2 triple 21-in.	130	—/340
Almirante Lynch, Almirante Condell	White.. ..	1912 1913	320 p.p.	32·6	11·1	3	1850	30,000	31	6 4-in. 4 M.	4 18-in.	190	427/80
Almirante Riveros (*ex*-Faulknor) .. Almirante Uribe (*ex*-Broke) .. Almirante Williams (*ex*-Botha)	White ..	1914	320 p.p.	32·6	11	3	1700 to 1740	30,000	31 31·5	2 4·7-in., 2 4-in.. or 2 2-pdr. A.A.	4 21-in.	174	403/83
SUBMARINES—													
Capitan Thompson .. Capitan Simpson .. Capitan O'Brien ..	Vickers Armstrong's	1929 1929 1928	275	27·5	14·8	..	1520/1990	2750/1300	15/9	1 4-in.	8 21-in.	..	200
H 1. Gualcola .. .. H 2. Tequalda.. .. H 3. Rucumilla .. H 4. Cuale .. .. H 5. Quidora .. .. H 6. Frezia	Fore River, U.S.A.	1915	150·3	15·75	12·3	..	355/470	480/640	13/11	..	4 18-in.	22	—/17·5

3 submarines are projected (no money voted)

Denmark.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement	Horse Power.	Speed.	Armament.	Torpedo Tubes	Complement.	Fuel.
			Length (Extreme).	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
TORPEDO BOATS. FIRST CLASS—													
T4. Glentin .. T5. Hogen .. .. T6. Ornen	Royal Dockyard, Copenhagen	1934	198·9	19·5	7·8	..	285	6,000	28	2 3·4-in.	6 17·7 in.	60	—/40
T3. Laxen .. .. T1. Dragen .. T2. Hvalen ..		1930 1929 1930	198·9	19·5	7·4	2	281	6,000	28	2 3-in.	8 17·7 in.	46	—/26
R4. Havkatten † R5. Sælen † .. R3. Nordkaperen † R2. Makrelen † .. S6. Narhvalen * .. S5. Havhesten * .. S4. Söhunden * .. S3. Sölöven * .. S2. Stören * .. S1. Springeren * ..		1919 1919 1918 1918 1917 1917 1917 1916 1916	126·3	13·9	9	2	96	2,000	24·6 *t.*	2 6-pr. A.A.	2 (1 in R2-4)	22	15/—
P1. Hvalrossen †		1913	148·2	16·9	7·5	2	158	3,480	26·2 *t.*	1 3-in.	4 18″	30	28/—
O3. Söülven .. O2. Flyvefisken O1. Söridderen ..	Burmeister, Copenhagen Yarrow & Co.	1911 1911 1911	181·7	18	6·5	2	222	5,000	27·5	2 3-in.	5 18″	33	80/—
N3. Spaekhuggeren N2. Vindhunden N1. Tumleren ..	Royal Dock., Copenhagen Schichau	1911	184·8	19·1	7·1	2	247	5,000	27·5	2 3-in.	5 18″	34	80/—
SUBMARINES—													
Daphne. D1 .. Dryaden. D2 ..	Royal Dockyard, Copenhagen	1926	161	16	8·2	..	305/370	900/400	13·4/7	1 3-in. A.A	6 18″	18	—/16
Flora. C3 .. Bellona. C2 ..	,,	1919	155·7	14·4	3·8	..	301/369	900/640	14·5/10·5	1 6-pr.	4 18″	24	—/13
Rota. C1 ‡ .. Galathea. B12 .. Triton. B10 .. Ran. B9	,, ,, ,, ,,	.. .. 1914 1915	133·3	12·3	8	..	181/231	450/340	13·5/9·8	1 6-pr.	3 18″	12	—/9

* Used as minesweepers. † Used as patrol vessels.
‡ Rota has one deck tube in addition.

France.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Length. (Extreme.)	Beam.	Draught.								
FLOTILLA LEADERS—			Feet	Feet.	Feet.		Tons.		Knots.				Tons.
Volta	Ch. de Bretagne, Nantes	Bldg.	452	41·1	15	..	2,884	90,000	38	8 5·4-in. 4 1·5-in. A.A.	9 21·7	240	..
Mogador	Lorient	Bldg.										..	..
Le Fantasque	Lorient	1934	434½	39⅓	14	..	2,569	74,000 Terrible did 45 knots on trial.	37	5 5·5-in 4 1·5-in., A.A.	9 21·7 in.	220	— / 650
L'Audacieux	Lorient	1934											
Le Malin	Ch. de la Mediterranée	1934											
L'Indomptable	Ch. de la Mediterranée	1934											
Le Triomphant	Ch. de France	1934											
Le Terrible	Ch. de France	1934											
Vauquelin	Ch. de France, Dunkirk	1932	424¼	39	14	2	2,441	74,000	37	5 5·5-in, 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Kersaint	Ch. de la Loire, Nantes	1931											
Cassard	Ch. de Bretagne, Nantes	1932											
Tartu	Ch. de la Loire, Nantes	1931											
Maillié Brézé	Ch. de Penhoet, St. Nazaire	1931											
Le Chevalier-Paul	Ch. de la Mediterranée, Havre	1932											
Aigle	Ch. de France, Dunkirk	1930	426	38	14	2	2,441	74,000	37	5 5·5-in., 4 1-pr. A.A.	6 21·7 in.	220	— / 500
Vautour	Ch. de la Mediterranée, Havre	1930											
Albatros	Ch. de la Loire, St. Nazaire	1930											
Gerfaut	Ch. de Bretagne, Nantes	1930											
Milan	Lorient	1930	426	38	14	2	2,441	75,000	37	5 5·5-in., 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Epervier	Lorient	1930											
Valmy	Ch. de Penhoet, St. Nazaire	1928	427	37¾	15	2	2,436	70,000	36	5 5·5-in. 4 1-pr. A.A.	6 21·7 in.	216	— / 650
Verdun	Ch. de la Loire, St. Nazaire	1928											
Vauban	Ch. de France Dunkirk	1930											
Lion	Dunkirk	1929											
Bison	Lorient	1928											
Guépard	Lorient	1928											
Chacal	St. Nazaire	1924	416	36	14·8	2	2,126	50,000	35·5	5 5·1-in., 2 3-in. A.A.	6 21·7 in.	206	— / 530
Jaguar	Lorient Dy.	1923											
Leopard	St. Nazaire	1924											
Lynx	,,	1925											
Panthère	Lorient Dy.	1924											
Tigre	Nantes	1924											
Amiral Sénès, *ex*-German S. 113	Germany	1917	346·5	33·5	14·8	2	1,526	44,000	34	4 5·9-in., 2 1-pr.	2 D.	180	— / 700
DESTROYERS—													
Epee	..	..	..	..	..	..	..	..	..	..	..	..	..
Fleuret	..	..	..	..	..	..	..	..	..	..	..	..	..
Le Hardi	..	Bldg.	..	..	..	..	1,378	..	..	4 5·1-in.	..	..	..
Forbin	Ch. de Graville, Le Havre	1928	351·7	32·2	10·2	..	1,378	35,000	34	4 5·1-in., 2 1-pr. A.A.	6 21·7 in.	146	— / 300
Frondeur	Ch. Navals Français, Caen	1929											
Fougueux	Ch. de Bretagne, Nantes	1928											
Foudroyant	Ch. de Dyle et Bacalon, Bordeaux	1929											
Basque	Maritime	1929											
Bordelais	Bordeaux	1928											
Boulonnais	Caen	1927											
Brestois	Nantes	1927											
L'Adroit	Dunkirk	1927											
L'Alcyon	Bordeaux	1926											
Le Fortune	Caen	1926											
Le Mars	Caen	1926											
La Palme	Nantes	1926											
La Railleuse	Nantes	1926											
Bourrasque	Dunkerque	1925											

France—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—*Contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
Cyclone	Havre	1925	346½	31·7	10·2	2	1,319	33,000	33	4 5·1-in., 1 3-in. A.A.	6 21·7-in.	140	—/350
Mistral													
Orage	Caen	1924											
Ouragon													
Simoun	St. Nazaire	1924											
Sirocco	Rouen												
Tempête	Nantes	1925											
Tramontane	Bordeaux	1924											
Trombe	Harfleur												
Typhon	Bordeaux	1925											
Tornade	Barcelona	1925											
Ens. Roux, M. P. Lestin	Rochefort	1915	271	27	10·5	2	787	18,000	30	2 3·9-in., 1 3-in., 4 9 pr.	4 18-in.	98	—/206
Ens. Gabolde	Havre	1921	271	26·9	10·0	2	802	22,000	33	3 3·9-in., 1 3-in. A.A.	4 21·7-in.	98	—/200
Deligny, *ex*-S. 139 Chastang, *ex*-S. 133 Vesco, *ex*-S. 134 Mazare, *ex*-S. 135	Germany	1917	272·3	27	11·5	2	767	16,800	28	3 4·1-in., 4 M.	6 19·7-in.	113	—/246
Matelot Leblanc, *ex*-Austrian, Dukla	Fiume	1916	277·5	25·7	11·0	2	748	18,000	30·5	2 3·9-in., 6 9-pr.	4 21-in.	120	108/52
Téméraire, Intrépide,* Opiniâtre, Aventurier*	Nantes	1911	290·5	28·5	11·5	..	915	24,000	27	4 3·9-in. 1 3-pr. A.A.	4 18-in,	102	236/74
Algérien, Arabe, Hova, Kabyle, Sakalave, Sénégalais, Tonkinois	Japan	1917	272	24	10·5	..	601	11,060	29	1 4·7-in., 3 3-in. 1 3-in. A.A.	2 dbl. 18-in.	106	98/115

1st class torpedo boats (1905–7), Nos. 321, 349, 369, 85 tons, 2000 H.P., 26 knots, 1 3-in. gun, 1–3 torpedo tubes.
* Converted to oil-burning.

Name or Number.	Where Built.	Launched.	Length.	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil.
CRUISER SUBMARINES—							Surf./Sub.	Surf./Sub.	Surf./Sub.				
Surcouf	Cherbourg	1929	393·7	29·5	23	2	2880/4300	7600/3400	19/11	2 8-in. 2 1-pr.	14 21-in	130	..
SUBMARINES—													
Roland Morillot	Cherbourg	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Agosta	Cherbourg	1934	302	26·2	..	..	1379/2060	7000/..	20/10	1 3 9 in. 1 smaller	11	..	..
Beveziers													
Ouessant	Brest	Bldg.											
Sidi-Ferruchi													
Sfax	Ch. de la Loire												
Casabianca		1935											
Le Glorieux	Cherbourg	1932	302·8	26·8	15·5	2	1379/1968	6000/2000	17/10	1 3·9-in. 1 1·5-in. A.A.	11	61	..
Le Centaure	Cherbourg	1933											
Le Héros	Brest	1933											
Le Conquerant	Brest	1932											
Le Tonnant	Loire	1934											
L'Espoire	la Seine	1931											
Persée	Ch. Navals Français, Caen	1930	301·8	26·8	15·5	2	1379/1968	6000/2000	18/10	1 3·9-in., 1 1·5-in. A.A.	11	61	..
Protée	Forge et Ch. de la Mediterranée la Seyne												
Pégase	Ch. de la Loire, St. Nazaire												
Phénix	Ch. Dubigeon, Nantes												
Achille Ajax	Brest	1933	301·8	26·8	15·5	2	1379/1968	6000/2000	18/10	1 3·9-in., 1 1·5-in. A.A.	11	61	—/96
Acheron	Ch. de la Loire, St. Nazaire	1929–1930											
Argo Acteon	Ch. Dubigeon, Nantes												
Pascal Pasteur	Brest	1928–1929	302·5	26·8	15·5	2	1379/1968	6000/2000	18/10	1 3·9-in. 1 1·5-in. A.A.	11	61	—/96
Poncelet Henri Poincare	Lorient												
Archimede	Caen												
Fresnel	Ch. de Penhoet, St. Nazaire												
Monge	Ch. de la Mediterranée, la Seyne												

France—*continued.*

Number and Name.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Speed. Surf./Sub.	Armament	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
CRUISER SUBMARINES—*Contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
*Perle	Toulon	1933	216·5	23·3	13·5	2	669/910	1300/800-1000	12/9	1 3-in.,* 64 mines	5	40	..
*Diamant		1933											
*Rubis		1930											
*Nautilus		1928											
*Saphir		1929											
*Turquoise		1929											
Redoubtable ..	Cherbourg ..	1928	302·5	30·5	15·5	2	1384/1968	6000/2000	18/10	1 3·9-in. A.A. 1 1-pr. A.A.	11	..	—/96
Vengeur													
Requin..	Cherbourg ..	1924	278·8	22·5	15	2	974/1415	2900/1800	16/10	1 3·9-in. A.A.	10	54	..
Morse		1925											
Narval		1925											
Souffleur		1924											
Caiman		1927											
Dauphin	Toulon ..	1925											
Espadon		1926											
Marsouin	Brest	1924											
Phoque..		1926											
SUBMARINES—													
Aurore..	Loire	..	..	..	..	..	..	..	..	..	..	..	..
Minerve	Cherbourg ..	1934	224	17·4	13	..	597/800	1800/1230	14¼/9	1 3-in.	8 21·7	43	..
Junon	Havre	1935											
Venus	Worms ..	1935											
Iris	Dubigeon ..	1934											
Orphée	Ch. Normand, Havre	1932	211	15 8	..	..	558–570/787	1300/1000	13·7/9	1 3-in., A.A.	8 21″	..	..
Oréade		1932											
Orion		1931											
Ondine		1931											
Psyche	Ch. Normand	1932											
Sybille	Worms ..												
Vestale..	Schneider												
Sultane													
Amphitrite	Le Trait ..	1932	216¼	16·2	12·7	2	565–571/787	1300/1000	13·7/9·2	1 3-in. A.A.	8 21″	..	..
Antiope	Havre	1932											
Atalante	Chalons-sur-Saone	1930											
Amazone	Le Trait ..	1932											
Diane	Chantiers Normand, Havre	1930											
Meduse		1930											
Argonaute	Schneider et Cie Chalons-sur-Saone	1929											
Arethuse		1929											
Ariane	Havre	1925	216·5	16	12·8	2	576/766	1200/1000	14/9	1 3-in. A.A.	7 21·7″	40	..
Danaé		1927											
Eurydice		1927											
Circé	Chalons ..	1925	204·5	17·5	12·8	2	552/765	1250/1000	14/9	1 3-in. A.A.	7 21·7″	40	..
Calypso		1926											
Doris		1927											
Thetis		1927											
Naïde	St. Nazaire	1925	210	17	12 8	2	548/744	1300/1000	14/9·5	1 3-in A.A.	7	39	..
Sirène		1925											
Nymphe		1926											
Galatée..		1925											
Néréide	Cherbourg ..	1914	243	19·8	12·3	2	771–1070	2900/1500	14/12	1 3-in. ..	8 18″	40	—/56
Gustave Zédé	Cherbourg ..	1913	243	19·7	12·3	..	771–1080	2400/1500	16/10	1 3-in. ..	8 18″	47	—/68
Joessel, Fulton	Cherbourg ..	1917	243	20·0	13·4	2	838–1181	2900/1650	17/10½	2 3-in. ..	8 18″	47	—/118
*Pierre Chailley ..	Havre	1922	229·7	26·3	13 0	..	798–1181	1800/1400	13·7/9	1 3·9-in., 2 M 40 mines	4 18″	43	—/54
*Maurice Callot ..	Bordeaux ..	1921	247·8	22	11·8	..	843–1270	2900/1640	16½/10	1 3-in., 40 mines	6 18″	48	—/44
Pierre Marrast (*ex*-U. 162)	,, ..	1918	235	21	12·7	2	744-1030	2400/1200	16/8·5	1 4-in., 1 M.	6 19·7″	48	—/98
Jean Autric (*ex*-U.105) Leon Mignot (*ex*-U.108)	,, ..	1917	234·5	21	12·5	..	744–1036	2400/1200	16·5/8·5	1 4·1-in., 1 M.	6 19·7″	48	—/81
Jean Corre (*ex*-U.B. 155)	,, ..	1917 1918	182·5	19	12	..	464-640	1100/760	12/7·5	1 4·1-in., 1 M.	5 19·7″	34	—/74
*René Audry .. .. (*ex*-U. 119)	,, ..	1917	267·5	24	14	..	1041-1525	2400/1200	14·5/7·2	1 5·9-in., 1 M 42 mines	4 19·7″	54	—/132

French submarines are divided into two classes. 1st class: All vessels of 850 tons and above in the surface condition, including the U minelayers. 2nd class: All smaller vessels.

*** Mine-laying submarines.**

Germany.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
16 *building* ..	..	..	..	..	..	.	1625	..	..	5 5-in.	8	..	..
Iltis	Wilhelms-haven	1927	304	28½	8¾	2	800	23,000	34	3 4·1-in.	6 19·7 in. (T.)	115	—/300
Wolf		1927											
Tiger													
Luchs		1928											
Jaguar													
Leopard													
Seeadler	Wilhelms-haven	1926	287¾	27¼	9½	2	800	23,000	33	3 4·1-in.	6 19·7 in. (T.)	111	—/300
Greif		1926											
Albatros		1926											
Kondor		1926											
Falke		1926											
Möwe		1926											
*G. 11	Germania Works, Kiel	1911 | 1912	233 †	25	10	2	650	16,000	32	2 4·1-in., 7 M.	2 19·7 in.	90	140/60
*G. 10													
*G. 8													
*G. 7													
TORPEDO BOATS—													
T. 23	Shichau Elbing Kiel	1913	234·6	24·6	10	2	630	15,700	32	2 4·1-in., 7 M.	2 19·7 in.	90	132/55
T. 196	Vulcan Works, Stettin	1911	243	26	10·5	2	787	18,000	32	2 4·1-in., 2 M.	2 19·7 in.	98	160/54
T. 190		1910											
T. 151, 153, 155–8 ..	..	1907–8	237	25½	10·1	2	664	10,900	30	2 3·9-in.	2 19·7 in.	97	—/172
SUBMARINES—													
U 1–13, U 17 ..	..	1935	136	13	12½	..	250/—	700/—	13/7	1 M.G.	3	..	..
U 14–16, *U* 18–20 ..	..	1935	..	..	..	..	250/—	700/—	13/7	1 M.G.	3	..	..
I–II	..	1935	..	..	..	..	750/—	..	..	..	..	..	..
III–VIII	..	1935	..	..	..	..	500/—	..	..	..	..	..	..

* Classified as torpedo boats in German official lists. † Length increased during alterations, 1929–30.

Greece.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Hydra	**Odero, Genoa**	**1931**	**308·8**	**30·3**	**10·5**	**..**	**1230**	**30,000**	**40**	**4 4·7 in., 4 2-pr. A.A.**	**6 21-in. (T.)**		
Conduriotis													
Spetsai			**308·8**	**30·3**	**11·3**	**..**	**1308**						
Psara													
Thyella	**Yarrow** ..	**1906**	**220**	**20·6**	**9·0**	**2**	**305**	**6000**	**30**	**2 3-in. 1 2-pr.**	**2 18-in.**	**70**	**80/—**
Sphendoni													
Niki	**Stettin (Vulcan)**	**1906**	**220**	**20·6**	**9·0**	**2**	**275**	**6000**	**30**	**2 3-in., 4 6-pr.**	**2 21-in.**	**70**	**80/—**
Aspis													
***Aetos, *Leon, *Panther, *Ierax** ..	**Birkenhead**	**1911**	**293**	**27·7**	**9·6**	**..**	**1013**	**19,750**	**32**	**4 4-in., (Panther and Aetos. 40 mines)**	**6 21-in. (T.)**	**110**	**—/260**
TORPEDO BOATS—													
Arethusa	**Stettin (Vulcan)**	**1913**	**147 8**	**9**	**4**	**..**	**142**	**2400**	**25**	**2 6-pr-**	**3 18-in.**	**..**	**..**
Doris													
†Aigli													
†Alkyonis													
‡Pergamos	**Fiume**	**1914**	**178·4**	**18 8**	**5**	**..**	**237**	**5000**	**28½**	**1 11-pr.**	**..**	**..**	**..**
‡Proussa													
‡Kios	**Monfalcone**												
‡Kyzikos													
‡Kydonia													
SUBMARINES—							**Surf./Sub.**		**Surf./Sub.**				
Katsonis	**Schneiders, Harfleur**	**1926**	**203¾**	**17·7**	**12·3**	**..**	**567/760**	**1300/1000**	**14/9·5**	**1 4-in., 1 2-pr. A.A.**	**6 21-in.**	**30**	**..**
Papanicolis	**Ch. de la Loire, Nantes**												
Nereus	**Ch. de la Loire, Nantes**	**1927**	**226½**	**18¾**	**12·6**	**2**	**689/945**	**1500/1200**	**14/9·5**	**1 4-in., 1 2-pr. A.A.**	**8 21-in.**	**45**	**..**
Proteus		**1927**											
Triton		**1928**											
Glaucos	**Ch. de France, Caen**	**1928**											

New programme includes 10 destroyers and a number of submarines. Contracts will be invited from foreign firms willing to undertake construction in Greece. The work will be spread over a number of years.

*** Reconstructed by Messrs. J. S. White & Co., Cowes, 1924–25. † On sale list.**

‡ Surrendered Austrian torpedo-boats employed on police duties.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal.	Oil.
*Flotilla Leaders—			Feet.	Feet.	Feet.		Tons		Knots.				Tons	
U. Vivaldi	Genoa (Odero)	1929	351 b.p.	33·3	17	..	1628	50,000	38	6 4·7-in. (in pairs) 6 2-pr. A.A. (L. Malocello has 4 1·5-in. A.A.). Carry mines	6 21-in. (T.)	200	—	500
A. Usodimare		1929												
L. Tarigo	Genoa (Ansaldo)	1928												
L. Malocello		1929												
L. Pancaldo	Riva Trigoso (Cant. Navali)	1929												
A. Da Noli		1929												
E. Pessagno	Ancona (Cant. Navali)	1929												
N. Da Recco		1929												
N. Zeno	Fiume	1928												
G. Da Verazzano		1928												
A. da Mosto		1929												
A. Pigafetta		1929												
Leone	Ansaldo	1923	359·3 b.p.	34·3	11·5	2	1525	42,000	34	8 4·7-in. (in pairs), 2 3-in. A.A., 60 mines.	6 18-in. (T.)	210	—	350
Pantera		1924												
Tigere		1924												
Aquila	Pattison	1916	310 b.p.	31	10·8	2	1407	39,800	36·5	4 4·7-in. (in pairs), 2 3-in. A.A., 50 mines	4 18-in. (D.)	140	—	260
Falco	Pattison	1916					1285							
Premuda (ex-German V116)	..	1918	347·8	34	14·2	2	1526	48,000	36	4 5·9 in., 2 2-pr. A.A.	4 19·7in. (D.)	150	—	720
Augusto Riboty	Ansaldo	1915	331·3 b.p.	32·2	9·8	2	1382	35,000	35	8 4-in., 4 2-pr. A.A., 100 mines.	4 18-in. (D.)	150		344
Carlo Mirabello		1914												
Destroyers—														
L. Oriani	Building	Laid down 1935	..	..	..	..	1449	44,000	38	4 4·7-in. 8 smaller A.A. guns	6	..	..	
V. Alfieri														
V. Gioberti														
G. Carducci														
†*Centauro*	Ancona	Laid down 1934	..	..	..	..	615	19,000	34	3 3·9-in. 2 smaller A.A. guns	4	..	..	
†*Climene*														
†*Sirio*	Fiume													
†*Perseo*														
†Spica	Partenopei,	1934	256	26	8·5	..	615	19,000	35	3 3·9-in 6 smaller	..	..	..	
†Astore	Naples	1934												
Maestrale	Fiume	1934	341	33	10	2	1449	50,000	38	4 4·7-in., 4 smaller A.A.	6 21-in.	..	..	
Grecale	Ancona	1934												
Libeccio	Ancona	1934												
Scirocco	Genoa													
Dardo	Odero, Sestri Pozente	1930	311	30	11	..	1206	44,000	38	4 4·7-in. 4 M. A.A.	6 21-in. (T.)	..		oil
Strale														
Freccia	Cant. Navale di Tirreno, Sestri Levante	1931												
Saetta		1932												
Folgore	Cantieri Partenopei, Naples	1931	315	30·5	10	..	1220	44,000	38	4 4·7 in. 4 M. A.A.	6 21-in. (T.)	..		oil
Lampo														
Baleno	Quarnaro Yard, Fiume													
Fulmine														
Borea	Ansaldo, Genoa	1927	311½	30	11	2	1073 1092	35,000	36	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	—	340
Zeffiro		1927												
Espero		1927												
Ostro		1928												
Aquilone	Odero, Genoa	1927												
Turbine		1927												
Nembo	Genoa Docks Co.	1927												
Euro		1927												
N. Sauro	Odero	1926	295½	30·2	10·5	..	1058	32,000	35	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	—	340
C. Battisti	Quanaro,	1926												
F. Nullo	Fiume	1925												
D. Manin		1925												
Francesco Crispi	Naples (Pattison)	1925	278·6	28·2	10	2	935	28,000	35	3 4·7-in., 2 2-pr. A.A. 2 M., 40 mines	2 dbl. 21-in.	106	—	200
Giovanni Nicotera		1926												
Bettino Ricasoli		1926												
Quintino Sella		1925												
Alessandro Poerio	Genoa (Ansaldo)	1914	279	26·3	9·3	2	844	20,000	32	5 4-in., 2 2-pr. A.A.	4 18-in. (D.)	100	—	250
Gulielmo Pepe														
†Impavido	Naples (Pattison)	1913	239½	24·0	8·4	2	540	13,500	30	5 4-in., 1 2-pr. A.A. 1 M., 10 mines	4 18-in. (D.)	71	—	110
†Indomito		1912												
†Insidioso		1913												
†Irrequieto		1913												
†Ardente	Orlando (Leghorn)	1912	239½	24·0	8·4	2	560	13,800	30	5 4-in., 1 2-pr. A.A. 10 mines	2 18-in.	71	—	110
†Giuseppe Sirtori	Genoa (Odero)	1916	237¾	24	9·0	2	669	15,000	32–33·8	6 4-in., 4 2-pr. A.A. 2 M.	4 18-in. (D.)	100	—	150
†Vicenzo Orsini		1917												
†Francesco Stocco		1916												
†Giovanni Acerbi		1916												
†E. Cosenz		1918	237¾	24	9·0	2	635	15,500	31–34	4 4-in., 2 3-in., 2 M. 10 mines.	4 18-in. (D.)	100	—	150
†Giacomo Medici		1917												
†G. La Farina		1918												
†Nicola Fabrizi		1917												
†Angelo Bassini		1917												
†Giacinto Carini		1917												
†G. La Masa		1917												

* Designated scouts in Italian official lists.

† Designated torpedo boats in Italian official lists.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*contd.*													
†Fratelli Cairoli †Antonio Mosto †Rosolino Pilo †Giuseppe Abba †Ippolito Nievo	Naples (Pattison) Genoa (Odero)	1914	36	24	8·8	2	615	13,500	30	5 4-in., 2 2-pr. A.A. 2 M.	4 18-in. (D.)	71	— 150
Cesare Rossarol, *ex*-German B97	Hamburg	1915	321½	30·6	9·5	2	744	40,000	34	3 4·7-in., 2 3-in. A.A. 24 mines	4 19·7in. (D.)	114	— 526
*Simone Schiaffino *Giuseppe Dezza *Giuseppe Missori	Genoa (Odero)	1914 1914 1915	236	24	8·8	2	615	13,500	30	5 4-in., 2 2-pr. A.A. 2 M.	4 18-in.	71	— 150
*Gen. A. Cantore *Gen. A. Chinotto *Gen. A. Papa *Gen. A. Cascino *Gen. M. Prestinari *Gen. C. Montanari		1921 1922	240⅓	24	9·0	2	635	18,000	30	3 4-in., 2 3-in. A.A. 2 M.	4 18-in. (D.)	100	— 150
Audace (*ex*-Japanese Kawakaze)	Yarrow	1917	287	27·5	8·3	2	628	21,500	34·5	7 4-in., 1 2-pr. A.A.. 2 M.	4 18-in. (D.)	111	— 252
Ardimentoso, *ex*-German S. 63	Schichau	1915	272	27·3	8 6	2	803	24,000	33	3 4-in., 2 3-in., 24 mines	4 19·7in. (D.)	98	— 305
Solferino, Palestro S. Martino, Curtatone Confienza, Castelfidardo, Calatafimi, Monzambano	Leghorn (Orlando)	1921 1922 1923	269 283½	26·5	8·6	2	860 966	18,000	32–33·5	4 4-in., 2 3-in. A.A., 2 M., 24 mines	4 18-in. (D.)	115	— 170
Cortellazzo Grado Monfalcone Zenson (*ex*-Pola)	Danubius *ex*-Austrian	1917 1913	274	25·5	8·2	2	561 594	22,000	32	2 3·9-in. 4 3-in. 6 smaller	4 18-in. (D.)	102	110 140
TORPEDO BOATS—													
Albatross O.L.T., 75	Orlando	1934 1918	139·5	15	5·5	2	310 169	3,400	28-29	2 3·9 in. 2 3-in. A.A.	2 2	.. ..	.. ..
SUBMARINES—													
Perla Diaspro Gemma Berillo Turchese Corallo	Montfalcone	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Malachite Ambra Iris Onice	Spezia	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Zoea † Foca †	Taranto	Bldg.	..	..	..	..	915 —	..	17 8	..	..	..	..
Calvi † Finzi † Tazzoli	Spezia	1935	..	..	..	..	1332 1965	4400 1800	17 8·75	2 4·7 in.	8 21-in.	..	..
Diamante Smeraldo	Taranto	1933	202	18·5	15	2	590 787	1,350 800	14 8·4	1 3·9-in.	6 21-in.	..	..
Rubino & Topasio	Fiume												
Zaffiro & Amestista	Orlando												
Serena, Naiade, Nereide, Anfitrite, Galatea, Ondina	Monfalcone												
Archimede, Galileo, Torricelli, Ferraris	Taranto	1934	231½	22½	13	2	880 1231	3,000 1,300	17·5 8·5	1 3·9-in.	8 21-in.	..	..
Glauco † Otaria †	Monfalcone	1934	240	23½	14½	2	860 1167	3,000 1,040	17·0 8·5	2 3·9-in.	8	..	..
3 ("Balilla" class)	Spezia	Bldg.	..	..	..	2	1333 1965	4,400 1,800	17 8·75	1 4·7-in., 1 smaller	8	..	..
Pietro Micca †	Taranto	1935	296	25½	17·5	..	1371 1883	3,200 1,500	16·0 8·5	2 4·7-in., 1 smaller	6 21-in.	..	..
Squalo, Narvalo, Delfino, Tricheco	Cantiere N., Triestino	1930	229	19	14·5	..	810 1077	3,000 1,400	16·5 9	1 4-in.	6 21-in.	64	..
Argonauta, Fisalia, & Medusa	Cantiere N.. Triestino	1931	200	19·5	13	..	599 791	1,200 800	14 8·5	1 4-in.	6 21-in.	..	..
Jalea & Jantina	Odero-Terni	1932											
Serpente (*ex*-Nautilus) & Salpa	Taranto												
Santorre Santarosa Ciro Menotti	Ansaldo	1929	230	19	15·5	..	815 1078	3,000 1,300	17·5 9	1 4-in.	8 21-in.	..	..
Fratelli Bandiera Luciano Manara	Monfalcone	1929											
Luigi Settembrini Ruggiero Settimo	Taranto	1930					797 1134	3,000 1,400					
E. Fieramosca	Taranto (Tosi)	1930	277	27	16·8	..	1340 1760	6,000 2,000	19 10	1 4·7-in. 1 3·9-in.,	8 21-in.	..	— 80
M. Bragadino F. Corridoni	Taranto (Tosi)	1929 1930	233	18·6	14	2	802 1051	1,500 1,000	14 8	1 4-in., 24 mines	4	..	— 41
Ballila A. Sciesa E. Toti D. Millelire	Spezia, Ansaldo	1927 1928 1928 1927	285	25·6	14	..	1368 1874	4,400 2,200	18·5 9	1 3·9-in.	6 21-in.	..	— 140

* Designated torpedo boats in Italian official lists. † Minelayer.

Italy—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—													
V. Pisani..	Montfalcone, Trieste	1927	223	18·7	13·8	..	791/1040	3,000/1,000	17·5/9	1 4-in. 1 M.	6 21-in.	..	—/48
M. Colonna		1927											
Da. Geneys		1928											
G. Bausan		1928											
G. Mameli	Taranto ..	1926	213·3	21·5	13	..	770/994	3,000/1,000	17/9	1 4-in.	6 21-in.	..	—/48
P. Capponi		1927											
T. Speri		1928											
G. Da. Procida ..		1928											
L. Mocenigo	Venice.. ..	1918	211·7	20·3	15·6	..	780/900	2,600/1,300	17/10	2 8-in., 1 M.	6 18-in.	32	—/50
L. Galvani		1919											
G. Nani	Spezia, F.I.A.T.	1917	218·0	19·3	14	..	708/909	2,600/1,300	17/10	2 3-in., 1 M.	6 18-in.	32	—/60
X 2, 3	Ansaldo ..	1916	139·9	18	11	..	390/460	660/360	10/6·3	1 3 in. A.A. 1 M., 18 mines	2 18-in.	..	—/8
H 1, 2, 3, 4, 6, 7, 8	Vickers ..	1917	150·3	15·8	12	..	336/466	620/480	13/10	1 3-in. A.A. 1 M., H1, 4, and 6 only	4 18-in.	22	—/18

Japan.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Compliment.	Fuel.
			Length (Extreme.)	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS :													
FIRST CLASS—													
Yudachi	Sasebo ..	Bldg.	336	32	..	..	1368	37,000	34	5 5-in. 2 M.G.	8 21″	..	..
Harusame	Maizurn ..												
Samidare	Uraga ..												
Umikaze	Maizuru ..												
Yamakaze	Uraga.. ..												
Kawakaze	Sasebo ..												
Suzukaze	Uraga.. ..												
Asashio	Maizuru ..												
Nurasame	Sasebo ..												
Shigure	Uraga.. ..												
Shiratzuyu	Sasebo ..												
Hatsushima	Uraga ..		338	32·7	8·8	..	1378	37,000	34	5 5-in. guns	9	..	..
Ariake	Kawasaki ..												
Yugure	Maizuru ..												
Wakaba	Sasebo ..	1934											
Nenohi	Uraga ..	1932											
Hatsuhara	Sasebo ..	1933											
Oboro	Sasebo	1929–1932	368 b.p.	34	10·7	..	1700	40,000	34	6 5-in., 2 M.	9 21-in.	210	..
Akebono	Fujinagata												
Sazanami	Maizuru												
Ushio	Uraga..												
Akatsuki..	Sasebo												
Hibiki	Maizuru												
Ikazuchi	Uraga..												
Inazuma	Fujinagata												
Sagiri	Uraga	1929											
Asagiri	Sasebo	1929											
Yugiri	Maizuru	1930											
Amagiri	Tokyo	1930											
Shikinami	Maizuru	1929											
Ayanami	Fujinagata	1929											
Fubuki	Maizuru ..	1927											
Shirayuki	Yokosuka ..	1928											
Hatsuyuki	Maizuru ..	1928											
Murakumo	Fujinagata	1928											
Shinonome	Sasebo.. ..	—											
Usugumo.. ..	Ishikawa-jima (Tokyo)	1927 1927											
Shirakumo	Fujinagata..	1927											
Isonami	Uraga	1927											
Uranami	Sasebo ..	1928											

Nine vessels, Arashio, Oshio, Mitsushio, Asagumo, Minegumo, Kasumi, Yamagumo, Natsagumo, and Kinone, are to be laid down.

Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal / Oil
			Length (extreme).	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—*contd.*													
First Class—*contd.*													
Minadzuki	Uraga	1926	320 b.p.	30	9·8	2	1315	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— 400
Fumitsuki	Fujinagata..	1926											
Nagatsuki	Ishikawajima	1926											
Kikudzuki	Maizuru ..	1926											
Mikadzuki	Sasebo.. ..	1926											
Mochidzuki	Uraga ..	1927											
Yudzuki	Fujinagata	1927											
Yayoi	Uraga	1924, 25											
Udzuki	Ishikawajima	1925											
Mutsuki	Sasebo.. ..	1924, 25											
Kisaragi	Maizura ..	1925											
Satsuki	Fujinagata..	1925											
Oite	Uraga	1924, 25	320 b.p.	30	9·6	..	1270	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— 400
Hayate	Ishikawajima	1925											
Yunagi	Sasebo.. ..	1924, 25											
Kamikaze ..	Nagasaki ..	1922											
Asakaze													
Harukaze ..	Maidzura ..	1922–24											
Matsukaze ..													
Hatakaze.. ..													
Asanagi	Fujinagata..	1924											
Sawakase..	Nagasaki ..	1919–22	320 b.p.	29·25	9·5	2	1215	38,500	34	4 4·7-in. 2 M. A.A.	6 21-in.	149	— 400
Okikase, Shimakase,													
Nadakase, Yukase,													
Hakase, Minekase	Maidzuru ..												
Namikase,	Mitsubishi,	1920–22											
Numakase, Nokase,	Kawasaki,												
Tashikase, Shiokase,	Maidzuru												
Hokase, Yakase,													
Akikase													
Urakase	Yarrow ..	1915	287·3	27·6	9·5	—	810	22,000	28	1 4·7-in., 4 3-in.	4 21-in.	116	— 248
Second Class—													
Wakatake ..	Kawasaki, Kobe	1922	275 b.p.	26·5	8·3	..	820	21,500	31·5	3 4·7-in., 2 M. A.A.	4 21-in.	110	— 250
Kuretake ..													
Fuyo	Fujinagata..	1922, 23											
Karukaya ..													
Asagao	Ishikawa-jima	1922–23											
Yugao													
Sanaye	Uraga	1923											
Yanagi, Momo ..	Sasebo.. ..	1916–18	275·0 b.p.	25·3	7·9	2	755	16,000	31·5	3 4·7 in., 2 M.	6 18-in.	109	92 212
Kashi, Hinoki ..	Maidzuru ..												
Kaya	Yokosuka ..	1917–19	275·5 b.p.	26	8	2	770	21,500	31·5	3 4·7 in., 2 M. A.A.	4 21-in.	80	— 290
Nashi, Kaki, Take	Kawasaki ..												
Kuri	Kure												
Nire, Tsuga	Ishikawa-jima												
Hagi	Uraga	1920–1922	275·5 p.p.	26	8	2	770	21,500	31·5	3 4·7 in. 2 M., A.A.	4 21-in.	80	— 290
Susuki, Yomogi	Ishikawa-jima												
Sumire													
Hishi, Hasu	Uraga,												
Tade, Fuji	Fujinagata,												
Aoi, Kiku ..	Kawasaki												
Tsuta, Ashi, ..													
Torpedo Boats—													
Chidori	Maizuru ..	1933	254	24	6	..	about 527	7000	26	3 4·7 in.	2	..	..
Manazuru	Fujinagata												
Tomazuru	Maizuru ..	1933											
Hatsukari	Fujinagata												
Otari	Maizuru	1935											
Hyodori	Ishikawa-jima												
Hayabusa	Yokohama	Bldg.	263	26	6¾	..	595	9000	28	3 4·7 in. 1 M.G.	3 21 in.	..	..
Kasasagi	Osaka												
Kari													
Sagi													
Haro													
Kiji													

Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel
			Length (extreme).	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons. Surf./Sub		Knots.				Tons.
SUBMARINES—													
I68 I69 I70 I71 I72 and I73 I74 and I75	Kure Kobe Sasebo Kawasaka ..	1933 1934 Bldg.	331	27	13	..	1400/—	..	..	1 4·7 in.	6	..	..
I8 I7	Kawasaki	Bldg.	..	..	..	..	1950/—	6000/—	17/—	2 5·5 in.	..	..	..
I6 I5	Kawasaki	1932	320	30	15·7	..	1955/—	6000/—	17/—	2 5 in.	6 21-in.	60	..
I65 I66 I67	Kure Sasebo Kobe	1931	321	25·6	15·9	..	1638/2100	6000/1800	19/9	1 4-in. 1 M.	6 21-in.	..	..
I61 I62 I64	Mitsubishi Kobe Kure	1929 1928 1929	320¼	25·7	16	..	1635/2100	6000/1800	21/7·9	1 4·7 in.	6	56	—/255
I4 I1, I2, I3	Kawasaki Kawasaki	1929 1926	320	30·2	15·7	..	1955/2480	6800/1800	17/9	2 5·5 in. 1 M.	6 21-in.	61	—/520
†I21 †I22 †I23 †I24	.. Kawasaki	1927 1928 1928 1928	279½	24·6	14	..	1142/1470	2400/1200	14/9·5	1 5·5-in.	4	45	..
I53 I55 I56 I54 I63 I60 I59 I58 I57	Kure Kure Kure Sasebo Sasebo Sasebo Yokosuka Yokusuka Kure	1927 1927 1929 1927 1928 1929 1929 1928 1929	331¼	26	16	..	1635/2100	6000/1800	21/7–9	1 4·7-in.	8 21-in.	56	—/255
Ro. 34	Kobe	Bldg.	..	..	..	..	700	1200	16/—	1 3-in. A.A.	..	..	..
Ro. 31	Mitsubishi	1927	243½	20	12·4	..	655/1000	1200/1200	13/10	1 3-in.	6	43	—/75
Ro. 65 Ro. 66 Ro. 67 Ro. 68 Ro. 64 Ro. 63, 62, 61 Ro. 60	Mitsubishi Mitsubishi Mitsubishi Mitsubishi Mitsubishi Mitsubishi Mitsubishi	1926 1927 1927 1925 1925 1924 1923	250	24·2	12·4	..	988/1300	2400/1800	16/10	1 3-in. 1 M.	6	47	—/75
I. 51 ‡ I. 52	Kure	1924 1925	300 330	28·7 25	15 16·8	..	1390/2000	6000/1800	19/7–9	1 4·7-in.	8	..	—/190
Ro. 32, 30 Ro. 29	Kawasaki Kawasaki	1924 1923	243·5	20	12·4	..	655/1000	1200/1200	13/10	1 4-in.	4	43	—/75
Ro. 28 Ro. 27 Ro. 26	Sasebo Yokosuka Sasabo	1923 1924 1922	230 b.p.	20·1	12	..	746/1000	2600/1200	16/10	1 3-in. 1 3-pr.	4 21-in	..	—/75
Ro. 59 Ro. 58, 57	.. ..	1923 1922	250	23·5	13	..	889/1082	2400/1200	17/10·5	1 3-in. 1 3-pr.	4 21-in.	65	—/76
Ro. 25, 19, 18, 17 Ro. 24 Ro. 23 22, 21, 20, 16	Sasebo, Kure Sasebo Yokosuka Yokosuka, Kure	1921 1920 1923 1922	230	20	12·2	..	735/986	2600/1200	17/16	1 3-in. H.A. 1 3-pr.	6 18-in.	43	—/75
Ro. 56, 55 54, 53 51	Mitsubishi Mitsubishi Mitsubishi	1922 1921 1920	231·5	23·5	13	..	893/1082	2400/1200	17/10·5	1 3-in. H.A. 1 3-pr.	6 18-in.	65	—/76

† Fitted for minelaying. ‡ Carries small seaplane.

Netherlands.

Name or Number.	Where built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal. / Oil.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
FLOTILLA LEADER—													
‡Tromp ..	Netherlands S. B. Co., Amsterdam	..	..	..	..	..	3350	50,000	32½	6 5·9 in. 4 5-in. 4 1½-in. A.A.	6 21″	285	..
DESTROYERS—													
*Banckert .. *Van Nes .. *Van Galen *Witte de With	Burgerhout Rotterdam Fijenoord Rotterdam	1929 1930 1928 1928	321·5	31	9 8	2	1316	31,000	34	4 4·7-in., 1 3-in. A.A., 4 1-pr., 4 M. 1 seaplane 24 mines	6 21″	126	— 330
Van Ghent *Evertsen .. *Piet Hein .. *Kortenaer	Flushing Rotterdam	1926 1926 1927 1927	321·5	31	9·8	2	1316	31,000	34	4 4·7-in. 2 3-in. A.A. 24 mines 1 seaplane	6 21″	126	— 330
1ST CLASS TORPEDO BOATS—													
G 13, 15 and 16 ..	Scheldt Fijenoord	1913–1914	162·5	17·3	9·0	..	150	2,600	25	2 3-in.	3 17·7″	27	40 —
Z 3	Amsterdam	1916–1917	201	20·4	6	2	277	5,500	27	2 3-in., 2 M.	4 17·7″	39	61 8
Z 5-8 ..	Scheldt Fijenoord	1915	192	19·8	5·5	2	264	5,500	27	2 3-in., 2 M.	4 17·7″	39	70 7
SUBMARINES—							Surf. Sub.						
K XIV .. K XV .. K XVI ..	Rotterdam	1932–3	242	21·5	13·3	..	810 1,000	3000 1000	17 9	1 3·5-in., 2 2-pr.	6	..	..
K XVII .. K XVIII ..	Fijenoord		..	..	..	..	825 1,020	..	..	..	..	..	..
K XIX .. K XX ..	..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
O 12 .. O 13 .. O 14 .. O 15 ..	De Schelde	1931	199	18·7	11·5	..	560 700	1,900 600	15 8	2 1·5-in. A.A.	5 21″	..	..
O 16 ..	De Schelde	Bldg.	254	21·5	13	..	878 —	3.200 860	18 9	1 3·5-in. 2 1·5-in.	5 21″	..	..
†K XIII .. †K XII .. †K XI ..	Fijenoord	1924	218 8	20·2	12·2	..	660 810	2,400 —	15 8	1 22-pr., 1 maxim	6	31	— 45
O 11.. .. O 10 .. O 9	Fijenoord Amsterdam Flushing	1925	179½	18·7	11½	..	506 627	900 —	12¾ 9	1 22-pr. A.A., 1 maxim	5 21″	29	— 21
O 8 (*ex*-British H6)	..	1914	150·3	15·8	12·3	..	364 434	480 320	13 8·5	1 maxim	4 17·7″	26	— 18
M1 (*ex*-German UC 8)	Hamburg	1915	111½	10·3	9	..	157 176	80 155	7½ 5	1 4-pr. 12 mines	—	16	— 2½
O 7	Fijenoord	1916	112	12·8	9·5	..	177 206	350 185	11·5 8·5	1 maxim	3 17·7″	12	— 5·4
O 6	De Schelde	1916	115·9	12·8	9·5	..	187 226	350 185	11·5 8·5				
O 5 .. .. O 4 .. .. O 3	De Schelde De Schelde De Schelde	1913 1913 1912	105 3	10·2	9·5	..	129 147	300 170	11 8·5	1 maxim	2 17·7″	10	— 3·6
†K X ..	De Schelde	1923	212	18·3	11·9	..	560 690	1,550 630	15 8	1 22-pr. 1 maxim	4 17·7″	29	— 45
†K IX ..		1922						1,550 630					
†K VIII ..		1922						1,800 630					
†K VII .. †K VI .. †K V	Fijenoord	1921 1920 1919	177·2	16·8	12·5	..	550 630	1,200 600	15 8	1 3-in., 1 maxim	6 17·7″	29	— 76
†K IV ..	De Schelde	1920	211·3	18·3	11·5	..	560 700	1,200 600	15 8	1 3-in., 1 maxim	6 17·7″	29	— 45
†K III ..		1919						1,800 600					
†K II.. ..	Fijenoord	1919	172·3	16·8	12·5	..	550 600	1,800 600	15 8	1 3-in., 1 maxim	6 17·7″	29	— 76

* Dutch East Indian Fleet. † Indian Military Marine.
‡ To replace Hertzog Hendrik. Should be referred to as a cruiser, but is officially termed a flotilla leader.

Norway.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Draug, Troll, Garm	Horten ..	1908–13	226	23·5	8·8	2	540	7,500 (Garm 8,000)	27·0	6 3-in. Draug has 6 4·7-in. in addition	3 18-in.	71	95/6
TORPEDO BOATS:													
FIRST CLASS—													
Snogg, Stegg, Trygg	Horten ..	1919–1920	173·9	18	5½	2	250	3,500	25	2 3-in.	4	31	30/—
Storm, Brand ..	Horten ..	1900	130·0	16·0	6·9	1	100	1,100	21	2 M.	2	19	17/—
Laks, Sild, Sael, Skrei	Horten ..	1901	126·4	15·0	6·9	1	100	1,150	21·8	2 M.	2 18″	19	
Two building	Horten ..	Bldg.	236·3	25·5	6·9	..	560	12,500	30	3 4-in., 1 1·5-in. A.A.	4 21″	..	..
SECOND CLASS—													
*Kjek, Hvas, Kvik, Blink Lyn, Hauk, Falk	Fredrikstad Horten ..	1898 1903	114·5	14·5	6·0	1	73	650–750	19–20	2 M.		14	11/—
Skarv, Teist	Horten ..	1906–7	133	14·5	6·5	1	100	1,600	25	2 3-pr.	2 18″	18	16/—
Lom, Jo, Grib.. ..			117	14·5	5·7	1	72	1,100	23	2 M.		16	15/—
Ravn, Orn	Horten ..	1903	113	14·5	5·7	1	73	850	23	2 M.		16	
Kjell	Horten ..	1912	135	14·9	6·4	1	100	1,800	25	2 3-pr.		19	15/—
SUBMARINES—													
A 2, 3, 4	Germania Kiel	1909 to 1913	133·2	15·7	8·9	2	246/332	900/380	14/7	—	3 18″	17	—/12·8
B 1, 2	Horten ..	1922	167·8	17·5	10·5	2	413/545	900/640	14·5/10	1 12-pr.	4 18″	23	—/21
B 3, 4	Horten ..	1923–24											
B 5, 6	Horten ..	1929											

* Employed as patrol ships.

Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Felix Dzerzhinski Petrovski .. Nezamojni .. Shaumyan ..	Ship & Eng. Co., Nikolaev	1917	303·5	29·5	10·5	..	1326	29,000	33	4 4-in., 2 7-pr., 4 M., can carry 80 mines	12 18″ (T.)	120	—/390
Karl Marx .. Kalinin	Revel.. ..	1915	344·5	31·3	9·7	..	1350	32,700	35	5 4-in., 1 3-in. A.A., carries mines	9 18″ (T.)	110	—/400
Uritsky .. .. Volodarski ..	Leningrad..	1914	321·5	30·5	9·25	..	1610	32,000	35	4 4-in., 1 3-in. A.A., 2 M., 80 mines	9 18″ (T.)	110	—/400
Rykov .. .. Engels .. .. Stalin .. .. Artem .. .. Voikov .. .. Lenin		1914–1915	314·75	30·5	9·75	..	1260	30,000	35			110	—/350
Bezpokoini* .. Gnyevni* .. Derski*	Nikolaev ..	1913–14	307·7	29 5	9	..	1088	25,500	34	3 4-in., 2 3-pr., 4 M.	10 18″ (D.)	140	—/260
Pospyeshni* .. Puilki*	Leningrad..	1913–14	321·5	30·5	9·8	..	1100	23,000	34	3 4-in., 2 3-pr., 4 M., 80 mines	10 18″ (D.)	120	—/351
Frunze	Leningrad ..	1914	336	31·1	9·8	..	1100	23,000	34	4 4-in., 1 3-in., 4 M.	6 (D.)	120	—/360
C CLASS GUARD SHIPS—													
Shtorm .. .. .. Shkval	.. ..	1932	..	..	..	..	470	..	29	2 5-ins., 2 4-in.	3	..	..

* Under French protection at Bizerta.

Soviet Union—*continued.*

Name or Number.	Where Built.	Date of Completion.	Dimensions.			Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—													
B4 and 5		1931	279	23	16½	..	896/1318	1500/1200	15/8	1 4-in. A.A.	8	..	..
Revoluzioner	Nikolaiev ..												
Yakobinetz													
Spartakovetz	Sevastopol												
Dekabrist	..	1931	279	23	16½	..	1000/—	1500/1200	16/10	1 4-in.	8	..	..
Narodvoletz													
Politrabotnik (*ex*-Ag 26)	..	1924	150¼	15¾	5¼	..	355/467	480/320	13/11	1 6-pr.	4 18"	..	..
Marxist (*ex*-Ag 25)	..	1922	150¼	15¾	15¼	..	375/467	480/320	13/11	1 6-pr.			
Kommunist(*ex*-Ag 24)	..	1922											
Shakter (*ex*-Ag 23),	..	..											
Ag 22*	..	1920	..	..	..	..	..	..	13/7·5	1 4-in., 2 M.	6 18"	..	—/17
Proletary	..	1916	223	14·5	12·5			2640/900	16/9	1 6-pr., or 2 6-pr., 1 M.	4	33	—/40
Rabotchky	..	1917						2640/900	16/9	42 mines	4	..	
Tyulen*	..	1915	220	14·5	12·7			500/1400	10/11·7	1 4-in.. 1 6-pr., 2 M.	4	52	—/2
Politruk	..	1913											
Utka*	..	1916											
Burysevyestnik* ..	..	1918	223	14·5	12·5		650/784	500/900	10/9	2 11-pr., 1 1-pr., 1 M.	4	52	—/40
Batrak	..	1917						2640/900	16/9	1 11-pr.	4	33	
Krasnoarmeyets ..	..	1917						2640/900	16/9	2 6-pr., 1 1-pr.	4	33	..
Komissar	..	1916											
Bolshevik	..	1916											
Komunar (*ex*-Tigr)	..	1916	223	14·5	12·6			500/900	10/9	2 6-pr., 1 1-pr., 1 M.	4	33	—/40
Tovaristch	..	1916											
Krasnoflotetz ..	..	1916											
Bedryak		1916											
L55 (*ex*-British, raised from Baltic)	..	..	230 b.p.	23·5	13·2	..	900/1150	2400/1600	17·5/10·5	2 4-in. guns	6 21"	..	—/78

In addition to the above about four other submarines are understood to be building or authorised. * Under French protection. There are about thirty-five destroyers and torpedo-boats completed from 1895 to 1912 of very little if any fighting value. Many of the above vessels are known to be practically useless until very extensively repaired and refitted.

Spain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FLOTILLA LEADERS—													
Gravina	**Cartagena ..**		**331¾**	**31·7**	**10·5**	**2**	**1,650**	**42,000**	**36**	**5 4·7-in. 1 3-in. A.A. 4 M.**	**6 21-in. (T.)**	..	**—/540**
Escano													
Ciscar		**1934**											
Jorge Juan													
Ulloa													
Almirante Valdés ..		**1930**											
„ **Antequera**		**1930**											
„ **Miranda**		**1931**											
Churruca		**1929**											
Alcala Galiano ..		**1930**											
Lepanto		**1928**											
Almirante Ferrandiz		**1928**											
José Luis Diez ..		**1928**											
Sanchez-Barcaiztegui		**1926**											
DESTROYERS—													
Alsedo	**Cartagena ..**	**1922**	**283**	**27**	**9**	**2**	**1,145**	**33,000**	**34**	**3 4-in., 2 2-pr. A.A.**	**4 21-in. (D.)**	**70**	**—/265**
Velasco		**1923**											
Juan Lazaga		**1924**											
Villaamil (Minelayer)	**Cartagena ..**	**1913**	**221¼**	**22¼**	**7**	..	**539**	**6,250**	**28**	**5 6-pr.**	**4 18-in.**	**70**	**80/—**
TORPEDO BOATS—													
12 boats	**Cartagena ..**	**1913–1922**	**164**	**16·5**	**4·9**	**3**	**187**	**3,750**	**26**	**3 3-pr.**	**3 18-in.**	**31**	**33/—**
SUBMARINES—													
D1	**Cartagena ..**	**1934**	**276**	**21·8**	..	..	**1050/1375**	**5000/1350**	**20·5/9·5**	**1 4·7-in., 4 M.**	**6 21-in.**	..	..
D2 & D3		**1935**											
C 2–6..	**Cartagena ..**	**1928–1929**	**240**	**20·8**	**13·5**	..	**900/1270**	**2000/750**	**16/8·5**	**1 4-in., 1 3-in. A.A.**	**6 21-in.**	..	..
Isaac Peral (*ex*-C 1)													
B 1–6	**Cartagena ..**	**1921–24**	**210**	**18·9**	**11·25**	..	**560/830**	**1400/850**	**16/10·5**	..	**4 18-in.**	**28**	**—/66**

11 submarines are authorised (1926 programme).

Sweden.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Goteborg	Gothenburg	Bldg	303·2	29·2	10·5	..	881	24,000–26,000	39	3 4·7-in., 2 2-prs. A.A., 2 M.	2 trpl 21″	125	— / 150
Stockholm	Karlskrona												
Klas Horn	Malmo	1931							35				
Klas Uggla	Karlskrona												
Ehrensköld	Göteborg	1926											
Nordenskjold	Malmö												
Magne	Thornycroft	1905	216	20·8	9	2	354	8,000	30	6 6-prs.,	2 18″	..	80 / —
Wale..	Malmo ..	1906	216	20·8	9	2	354	8,000	30	2 3-in., 4 6-prs.	4 18″	..	
Ragnar†	Malmo ..	1909	216	20·8	9	2	354	8,000–9,000	30·0	4 3-in., 2 M.	4 18″ (D.)	67	80 / 3
Sigurd	Gothenburg	1909											
Vidar	Malmo ..	1909											
Hugin	Gothenburg	1909											
Munin	Malmo ..	1910											
Wrangel †	Gothenborg	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18″	72	107 / 6
Wachtmeister ..													
Torpedo-Boats—													
1st Class—													
Castor‡, Pollux‡ ..	Normand & Karlskrona	1908	128	14·5	8·5	1	103	2,000	25	2 6-prs. (except Castor and Pollux which have 2 1-prs.)	2 18″ (‡)	18	20 / —
Vega‡	Karlskrona..	1910											
Vesta‡													
Spica, Astrea, Iris, Thetis	Bergsund and Gothenburg	1909											
Altair‡	Stockholm ..	1908											
Antares‡													
Argo‡													
Arcturus‡													
Perseus, Polaris ..	Bergsund ..	1910–1915											
Regulus, Rigel ..	Stockholm ..												
Submarines—													
1st Class—													
Ulven	Naval Yard, Karlskrona	1930	217	21	10·8	..	700 / 850	2800 / —	16 / 9	1 4-in., 1 M.	4 20-in.	32	— / 40
Draken		1926											
Gripen		1928											
Bavern	Naval Yard, Karlskrona	1921	187	18·5	9·2	..	500 / 650	2800 / —	15 / 9	1 3-in., 1 M.	4 18″	..	— / 33
Illern													
Uttern													
Svärdfisken	Kockum Co., Malmo	1914	137·7	12·5	9·8	..	300 / —	800 / —	15 / 9	1 6-pr.	2 18″	..	— / 8
Tumlaren													
Sälen	Kockum Co., Malmo ..	1920	177 2	16 2	11 2	..	450 / 580	..	..	1 3-in., 1 M.	4 18″	..	— / 23
Valrossen													
Hajen													
Minelaying Sub.—													
Valen	Karlskrona	1925	187·2	23·2	9·4	..	500	..	..	1 3-in., 1 M.	4 18″	..	— / 34
Nordkaparen	Malmo ..	1935	..	..	..	..	500 / 720	..	15 / 10	1 4-in.	4 21″	..	..
Delfinen													
Springaren													
Sjolejonet		Bldg.											
2nd Class—													
Aborren	Karlskrona D.Y.	1914–15	101·7	11·7	10·2	..	173	..	..	..	2 18″	..	— / 6·5
Braxen													
Laxen			88·6	11·7	10·2	..	133	..	..	..	1 18″	..	— / 4·0

† Fitted for mine-laying.

* Also six small 2nd class torpedo-boats, Nos. 5–9, 14 (60 tons, 20 knots, built 1907–1908), and two motor torpedo-boats, Nos. 3 and 4.

‡ Torpedo-boats marked ‡ have one 18-inch tube only.

United States.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Oil.
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DD395	..		372	32¼	10⅓	..	1850	..	..	5-in. guns	..	..	..
DD394	..												
Somers	Federal S.B. & D.D. Co.												
Warrington													
Porter	N.Y.S. Co., Camden												
Selfridge													
McDougal													
Winslow													
Phelps	Bethlehem S.B. Co., Quincy												
Clark													
Moffett													
Balch													
DD408	..	Bldg. est. 1936	334 on W.L.	34¾	9¾	..	1500	..	..	5-in. guns	..	..	..
DD407	..												
DD406	..												
DD405	..												
DD404	..												
DD403	..												
DD402	..												
DD401	..												
DD400	..												
DD399	..												
DD398	..												
DD397	..												
DD396	..												
DD395	..												
DD394	..												
Jarvis	Navy Yard, Puget Sound												
Patterson													
Henley	Navy Yard, Mare Is.												
Ralph Talbot	Navy Yard, Boston												
Mugford													
Helm	Navy Yard, Norfolk												
Blue													
Bagley													
Fanning	United D.D. Co.												
Dunlop													
Craven	Bethlehem S.B. Co.												
Gridley													
Mahan	United D.D. Inc., N.Y.												
Cummings													
Drayton	Bath I.W. Co.												
Lamson													
Flusser	Federal S.B. & D.D. Co.												
Reid													
Case	Navy Yard, Boston												
Conyngham													
Cassin	Navy Yard, Philadelphia												
Shaw													
Tucker	Navy Yard, Norfolk												
Downes													
Cushing	Navy Yard, Puget Sound,												
Perkins													
Smith	Navy Yard Mare Is.												
Preston													
Dale	Navy Yard, N.Y.	1935	334	34¼	9¼	..	1,395	42,800	36½	5 5-in. A.A. 8 or 10 M.	8 21-in. (Q)	160	400
Monaghan	Navy Yard, Boston						1,395						
Aylwin	Navy Yard, Philadelphia						1,375						
Farragut	Bethlehem S.B. Co.	1934					1,365						
Dewey	Bath, I.W.Co.						1,345						
Hull	Navy Yard, N.Y.	1935					1,395						
MacDonough	Navy Yard, Boston						1,395						
Worden	Navy Yard Puget Sound						1,410						

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Oil.
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*continued.*													
Pruitt	Bath, I.W.	1920	314·4	31	9·8	..	1,190	25,000	35	4 4-in., 1 3-in. A.A. (Kane, Fox, Brooks, and Hatfield have 4 5-in. guns.)	4 triple 21-in.	122	375
Sicard													
Preble		1920						24,200					
William B. Preston	Norfolk, N.W.	1920											
Noa		1921											
Hulbert		1920											
Decatur	Navy Yard, Mare Is.	1922											
Perry		1922											
Trever		1922											
Wasmuth		1921											
Zane		1921											
Litchfield		1920											
Meade	Bethlehem S.B. Co., Squantum	1919						27,000					
Swasey													
Tingey													
Morris													
Thornton													
Bailey													
Shubrick													
Ballard													
Greene													
Edwards													
McLanahan													
Laub	Bethlehem S.B. Co., Quincy												
Gillis													
Turner													
Aulick													
Welles													
Bancroft													
Osmond Ingram													
Rodgers													
McCalla													
McCook													
Belknap		1919											
Lawrence	New York S.B. Co.	1921						26,000					
Hopkins		1921											
Barry		1920											
Goff		1921											
Bainbridge		1921											
Reuben James		1920											
Williamson													
Sands													
King													
Childs													
Sturtevant													
Overton													
James K. Paulding													
McFarland													
Humphreys													
Kane													
Fox													
Gilmer													
Brooks													
Hatfield													
Paul Jones	Cramp, Pa.	1921											
Truxton													
John D. Ford													
Pillsbury													
Peary													
Pope		1920											
Stewart	Cramp, Pa.	1920	314·4	31	9·8	..	1,190	26,000	35	4 4-in., 1 3-in. A.A. (Long and Hovey have 8 4-in. in twin mtgs. and 1 3-in. A.A.)	4 triple 21-in.	122	375
McCormick													
Bulmer													
Simpson													
MacLeish													
Edsall													
Parrott													
Whipple													
J. D. Edwards													
Borie													
Tracy													
Barker	Newport News S.B. Co.	1919											
Smith Thompson													
Alden													
Broome													
Long													
Hovey													
Southard													
Chandler													

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
DESTROYERS—*continued.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Dallas	Newport News S.B. Co.		314·4	31	9·8	..	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	375
*Herndon													
Branch		1920											
*George E. Badger													
*Welborn C. Wood		1921											
*Hunt		1920											
*Abel P. Upshur		1920											
Mason		1920											
Satterlee		1919											
Goldsborough		1920											
Dahlgren													
Clemson		1919											
Bagley		1919	314·4	31	9·8	..	1,060	25,000	35	4 4-in., 1 3-in A.A.	4 triple. 21-in.	122	286
Abbot													
Haraden													
Thomas													
Hopewell													
Stansbury	Union I.W.	1920	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Howard		1920											
Hogan													
O'Bannon													
Renshaw													
Mackenzie													
Kalk	Fore River S.B. Co.	1919											
Foote													
Maddox													
Cowell													
Bush													
Meredith													
Crosby													
Walker													
Thatcher													
Palmer		1918											
Herbert	N.Y. S.B. Co.		314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Schenck													
Leary													
Dickerson													
J. Fred Talbot	Cramp, Phil.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Cole													
Ellis													
Bernadou													
Dupont													
Biddle													
Blakeley													
Barney													
Breckenridge													
Roper													
Elliot													
Greer		1918											
Upshur													
Yarnall													
Tarbell													
Hamilton	Mare Island, N.Y.	1919	314·4	31	9·5	..	..	24,200	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Claxton		1919											
Ward		1918											
Kennison		1919											
†Kilty		1918											
†Boggs		1918											
Tillman	Bath I.W.	1921						26,000					
Crowninshield		1919						24,200					
Hale													
Aaron Ward													
Buchanan								26,000					
Jacob Jones	New York S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Babbitt													
Twiggs													
Badger													
Tattnall													
Radford	Newport News S. Co.	1919	314·4	31	9·8	..	1060 1090	25,000	35	4 4-in. 1 3-in. A.A	4 triple 21-in.	122	286
Lamberton													
Lea	Cramp, Pa.	1918	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A. (Rathburne has 3 4-in.)	4 triple 21-in.	122	286
Dorsey													
Dent													
Waters													
Talbot													
Rathburne													

† Equipped as targets, wireless controlled. * Operated by the U.S. Coast Guard.
Destroyers Hazelwood, Stoddert and Sinclair are employed as target ships.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Oil.
			Feet.	Feet.	Feet			Tons.	Knots.				Tons.
Destroyers—*continued.*													
Crane		1919											
Williams ..		1919											
Chew	Union Plant.												
No. 105, *ex*-Mugford			314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Champlin ..													
Schley ..		1918											
Bell	Fore River S.B. Co.												
Taylor ..	Mare Island, N.Y.	1918	314·4	31	9·8	..	1,090	27,000 24,200	35	4 4-in., 1 3 in. A.A.	4 triple 21-in.	122	286
Fairfax ..													
No. 92, *ex*-Gridley		1919											
Harding ..		1919											
McKean ..	Union I.W.	1919	314·4	31	9·9	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Ringgold ..		1918											
Robinson ..		1918											
McKee.. ..		1918											
Stevens ..													
Colhoun ..													
Dyer													
Stringham ..	Fore River S.B. Co.		314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Gregory ..													
Sigourney ..		1918											
Kimberly ..													
Little													
Evans								27,000					
Philip	Bath I.W.		314·4	31	9·7	..	1,090	27,000	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Wickes ..								24,200					
Manley ..		1917						20,000	32	3 4-in., 1 3-in. A.A.			
Stockton ..	Cramp Pa.	1917						18,500	30	5 4-in., 1 3-in. A.A.			
Conner ..		1918											
Gwin	Seattle D.D. Co.	1920	315·5	30·7	9·5	..	1020	18,750	30	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	260
No. 70, *ex*-Craven	Norfolk, N.Y.	1918						20,000	32	4 4-in., 1 3-in. A.A.			
Caldwell ..	Mare Island N.Y.	1917	315·5	30·7	9·5	..	1020	21,000	30	4 4-in., 1 3-in. A.A.			
Allen	Bath I.W.	1917	315·3	29·9	9·8	..	920	17,500	30	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	290
Rowan .. Sampson ..	Fore River S.B. Co.	1916	315·3	29·9	10·7	..	920	17,000	29·5	4 4-in., 1 3-in. A.A.			
Wadsworth..	Bath I.W.	1915	315·3	29·9	10	..	910	17,500	30	4 4-in.	4 dbl. 18-in.	118	310
†No. 55 *ex*-Cushing ..	Fore River S.B. Co.	1915	305·3	30·4	10·5	..	860	17,000	29	4 4-in. 1 3-in. A.A.	4 dbl. 18-in.	106	308
†No. 53 *ex*-Winslow .. Nicholson .. O'Brien ..		1915	305·3	30·3	10·5	..	860	17,000	29				
†No. 50 *ex*-Balch ..		1914											
Benham ..		1914								4 4-in. 1 3-in. A.A. (*ex*-Parker 4 4-in.)	4 dbl. 18-in.	106	310
Parker ..	Cramp.	1913	305·3	30·5	10·5	..	820	16,000	29·5				
†No. 47 *ex*-Aylwin ..		1914											
Duncan ..	Fore River S.B. Co.	1913	305·3	30·4	10	..	820	16,000	29				
†No. 45 *ex*-Downes ..	N.Y.S.B. Co.	1915											
†No. 44 *ex*-*Cummings	Bath I.W.	1913	305·3	30·4	9·8	..	820	16,000	29	4 4-in.	4 dbl. 18-in.	104	306
†No. 43 *ex*-*Cassin													
†No. 54 *ex*-*McDougal ..	Bath I.W.	1914	305·3	30·6	9·8	..	860	16,000	29·5				311
*Ericsson ..	N.Y.S.B. Co.	1915	305·3	30·6	10·7	..	860	17,000	29				305
†No. 57 *ex*-*Tucker ..	Fore R.S.B.Co.	1916	305·3	29·9	10·3	..	910	17,000	29·5	4 4-in.	4 dbl. 18-in.	104	309
†No. 58 *ex*-*Conyngham	Cramp.	1916	315·3	29·9	10·1	..	910	18,500	29·5				308
†No. 59 *ex*-*Porter ..	Cramp.	1916	315·3	29·9	10·1	..	910	18,000	29·5				308
*Wainwright ..	N.Y.S.B. Co.	1916	315·3	29·9	10·7	..	910	17,000	29·5				308
*Davis	Bath I.W.	1916	315·3	29·9	9·8	..	920	17,500	30		4		290
*Wilkes	Cramp.	1917	315·3	29·9	10·7	..	920	18,000	29·5	4 4-in. 2 3-in. A.A.	triple	120	290
*Shaw	Mare I., N.Y.	1916	315·3	29·9	10·7	..	910	17,000	29·5		21-in.		290

* Operated by the U.S. Coast Guard.

† These destroyers have been reverted to their numbers, and names have been taken for the 1933–1934 programme destroyers. They are being scrapped.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
DESTROYERS NOW FITTED AS MINELAYERS—													
Sproston ..	Union I.W.	1919	314·4	30·5	9	2	1,160	27,000	35	4 4-in. 1 3-in. A.A 92 mines	—	107	283
Anthony ..													
Ingraham ..													
Lansdale ..	Fore River S.B. Co.	1918											
Luce													
Israel													
Murray ..													
Stribling ..													
Lamsay ..	Newport News S. Co.	1918	314·4	30.5	9	2	1,160	25,000	35	4 4-in. 1 3-in. A.A.	—	120	286
Gamble ..													
Breese		1919											
Montgomery													
SUBMARINES—													
Perch	Electric Boat Co.	Bldg.	290	25	14	..	1,830 —	..	..	1 3-in.	6 21″	50	..
Pickerel ..													
Permit ..													
Plunger ..	Portsmouth Navy Yard												
Pollack.. ..													
Pompano ..	Mare Island Navy Yard												
Salmon ..		Bldg.	..	..	..	..	1,450 —	..	..	..	..	..	..
Seal													
Skipjack ..													
Snapper .													
Stringray ..													
Sturgeon ..													
Porpoise ..	Portsmouth Navy Yard.	Bldg. est. 1936	283	24·9	13	..	1290 estd.	..	..	3 in.			
Pike													
Shark ..	Electric Boat Co.	Bldg. est. 1936	288	25·1	13·9	..	1320 estd.	..	..	3 in.			
Tarpon ..													
V7 Dolphin	Portsmouth Navy Yard.	1932	307	27·8	13	..	1,540 2,215	4,250 —	17 8	1 4-in.	6 21″	58	..
V8 Cachalot	Portsmouth Navy Yard	1934	260	24·8	13	..	1,110 1,650	3,100 —	17 8	1 3-in. A.A.	6 21″	..	..
V9 Cuttlefish	Electric Boat Co.												
V4 Argonaut	Portsmouth Navy Yard.	1928	381	33·7	15 4	..	2,710 4,080	3,175 —	15 8	2 6-in., 60 mines	4 21″	86	..
V5 Narwhal	Portsmouth Navy Yard.	1930	371	33·3	16	..	2,730 3,960	5,450 —	17 85	2 6-in.	6 21″	88	..
V6 Nautilus	Mare Island Navy Yard.												
V3 Bonita ..	Portsmouth Navy Yard.	1926	341·5	27·5	15·5	..	2,000 2,506	6,700 —	14 9	1 5-in. (Bass has 1 3-in. A.A.)	6 21″	87	..
V2 Bass ..		1925											
V1 Barracuda		1924											
S48	Lake T.B. Co., Bridgeport	1922	265·3	21·8	13·5	..	1,000 1,458	2,000 1,500	14·8 11·0	1 4-in.	5 21″	..	237
S47*	Bethlehem Shipbuilding Corp., Quincy Plant	1925	225·3	20·5	16	..	850 1,126	1,200 1,500	14 10	1 4-in.	4 12″	44	154
S46*		1925											
S45*		1925											
S44*		1925											
S43*		1924											
S42*		1924											
S41*	Bethlehem Shipbuilding Corp., Union Plant	1924	219·3	20·5	16	2	800 1,062	1,200 1,500	14·5 11	1 4-in.	4 21″	42	140
S40*		1923											
S39*		1923											
S38*		1923											
S37*		1923											
S36*		1923											
S35*		1923											
S34*		1923											
S33*		1923											
S32*		1923											
S31*		1923											
S30*		1920											
S29*	Bethlehem Shipbuilding Corp., Quincy Plant	1924											
S28*		1923											
S27*		1924											
S26*		1923											
S25*		1923											
S24*		1923											
S23*		1923											
S22*		1924											
S21*		1923											
S20*		1922											
S19*		1921											
S18*		1923											

* **Designed by Electric Boat Co., Groton, Conn.**

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel Capacity.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
SUBMARINES—*continued.*													
S17 .. .. S16 .. .. S15 .. .. S14	Lake T.B. Co., Bridgeport	1921 1920 1921 1921	231	21·5	13	..	790 / 1,092	2,000 / 1,200	15·25 / 9	1 4-in.	4 21″	38	123
S13 .. .. S12 .. .. S11 .. .. S10	Navy Yard, Portsmouth	1923 1923 1923 1922	231	21·8	13	..	790 / 1.092	2,000 / 1,200	14·75 / 9	1 4-in.	5 21″	38	123
S9 .. .. S8 .. .. S7 .. .. S6 .. .. S4† S3		1921 1920 1920 1920 1919 1919	231	21·8	13	..	790 / 1,092	1,400 / 1,200	14 / 9	1 4-in.	4 21″	38	123
S1*	Fore River S.B. Co.	1920	219·3	20·7	16	..	800 / 1,062	1.200 / 1,500	14·5 / 11	1 4-in., 1 aeroplane	4 21″	38	140
R20* .. .. R19* .. .. R18* .. .. R17* .. .. R16* R15*	Union I.W.	1918	186·1	18	14·5	2	530 / 680	880 / 934	13·5 / 10·5	1 3-in.	4 21″	30	63
R14* .. .. R13* .. .. R12* .. .. R11* .. .. R10* .. .. R9* .. .. R8* .. .. R7* .. .. R6* .. .. R5* .. .. R4* .. .. R3* .. .. R2* R1*	Fore River S.B. Co.	1919											
O10*§ .. O9*§ .. .. O8*§ .. .. O7*§ .. .. O6*§ .. .. O4*§ .. .. O3*§ .. .. O2*§ .. .. O1*§	Fore River S.B. Co.	1918	172·3	18	14·4	2	480 / 629	880 / 740	14 / 10·5	1 3-in.	4 21″	30	73

* Designed by Electric Boat Co., Groton, Conn. † Used for salvage operations. Has no guns or torpedo tubes.

§ To be disposed of shortly.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.

TABLES OF COMPARATIVE NAVAL STRENGTH

TABLE I.—EFFECTIVE FIGHTING SHIPS, BUILT, BUILDING, AND PROJECTED.

Class.	British Empire.			U.S.A.			Japan.			France.			Italy.			Soviet Union.			Germany.		
	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.
Battleships { 14-in. guns and upwards	12	—	—	14	—	—	9	—	—	—	1	1	—	2	—	—	No details available.		—	—	—
Battleships { Below 14-in. guns	—	—	—	1	—	—	—	—	—	9	2	—	4	—	—	4			5	3	—
Battle-cruisers	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			—	—	—
Cruisers	54 (a)	12 (l)	—	26	12	—	33 (h)	3	1	17	5	—	27	3	—	5			6	2	—
Cruiser Minelayers	1	—	—	—	—	—	5	1	—	1	—	—	—	—	—	2			—	—	—
Minelayers	4	1 (m)	—	—	—	—	—	—	—	2	—	—	—	—	—	—			—	—	—
Armoured Coast Defence Vessels, Monitors, and Netlayers	4(b)	1 (n)	—	1	—	—	—	—	—	1	—	—	—	—	—	—			—	—	—
Aircraft Carriers	8 (c)	1	—	4	3	—	6 (i)	2 (r)	1	2(j)	—	—	1 (s)	—	—	—			—	—	1
Flotilla Leaders and Destroyers	169(d)	27	7	213(f)	53	—	96	11	9	71	17	—	96	8	—	19			12 (k)	16	—
Torpedo Boats	—	—	—	—	—	—	4	4	—	3	—	—	2	—	—	—			7	—	—
Submarines	51 (e)	9 (p)	—	84	16	—	57	10	—	82	8	2	64	13	—	23			14	14	—
Sloops	40	15 (q)	—	—	—	—	—	—	—	10	—	—	26	1	—	4			—	—	—
Coastal Motor Boats	—	6	—	—	—	—	—	—	—	9	—	—	42	1	—	—			—	—	—
Gunboats and Despatch Vessels	—	—	—	9	2	—	4	—	—	32	4	4	6	4	—	2			7	—	—
River Gunboats	18	—	—	8	—	—	7	—	—	11	1	—	2	—	—	—			—	—	—
Minesweepers	24	—	—	43 (g)	—	—	14	2	—	20	—	—	48	—	—	6			28	—	—
Fleet Escorts	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			—	10	—

NOTES:—

(a) Includes 3 due to be prepared for sale.
(b) Includes 1 netlayer.
(c) Including 2 seaplane carriers one of which is not regarded as part of the War Fleet.
(d) Includes 7 due to be prepared for sale.
(e) Includes 1 due to be prepared for sale.
(f) Includes 12 fitted as minelayers.
(g) Includes 6 fitted as submarine rescue vessels.
(h) There are also 7 old cruisers classed as Coast Defence or Special Service Vessels.
(i) Includes 2 seaplane carriers.
(j) Includes 1 aviation transport.
(k) Classed in Germany as large torpedo boats.
(l) Includes 1 not ordered.
(m) Not yet ordered.
(n) Netlayer.
(p) Includes 3 not ordered.
(q) Includes 7 not ordered.
(r) Includes 1 seaplane carrier.
(s) Seaplane carrier "Miraglia."

TABLE II.—BATTLESHIPS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.			tons.			tons.						tons.						
1927	Nelson	33,500	1923	Colorado	32,500	1921	Mutsu ...	32,720					*Building.*							
1927	Rodney	33,900	1923	West Virginia	31,800	1920	Nagato ...													
1916	Malaya	31,100	1921	Maryland ...	31,500	1918	Hyuga ...	29,990					*Vittorio Veneto*	35,000						
1916	Valiant		1920	Tennessee ...	32,300	1917	Ise													
1915	Barham		1921	California ...	32,600	1917	Yamashiro	29,330					*Littorio* ...							
1915	Queen Elizabeth		1919	Idaho	33,400	1915	Fuso													
1915	Warspite		1918	New Mexico ...	33,400	1915	Kirishima	29,330												
1916	Royal Sovereign	29,150	1917	Mississippi ...	33,000	1915	Haruna ...													
1916	Royal Oak ...		1916	Arizona	32,600	1913	Kongo ...													
1916	Revenge ...		1916	Pennsylvania ...	33,100															
1916	Resolution ...		1916	Oklahoma ...	29,000															
1917	Ramillies ...		1916	Nevada	29,000															
			1914	Texas	27,000															
			1914	New York ...																
	12 ships.	368,650		14 ships.	438,200		9 ships.	272,070					2 ships building	70,000						

TABLE III.—BATTLE-CRUISERS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standar Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.						tons.												
1920	Hood...	42,100																		
1916	Renown	32,000																		
1916	Repulse																			
	3 ships.	106,100																		

TABLE IV.—BATTLESHIPS WITH GUNS BELOW 14-IN.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Normal Displacement.	Completed.	Name.	Normal Displacement.
					tons.						tons.			tons.			tons.			tons.
			1912	Arkansas	26,100				1915	Bretagne	22,189	1916	Andrea Doria	21,555	1914	Marat ...	23,606	1936	Admiral Graf Spee	10,000
									1916	Lorraine...		1915	Caio Duilio ...		1914	October Revolution	23,256	1934	Admiral Scheer	
									1916	Provence		1915	Conte di Cavour	21,604	1914	Paris Commune	23,016	1933	Deutschland	
									1913	Courbet ...		1914	Giulio Cesare	21,818		Mikhail Frunze	—	1907	Hannover	13,040
									1913	Jean Bart								1908	Schleswig-Holstein	
									1914	Paris ...								1908	Schlesien	
									1911	Diderot ...	17,597								*Building:—*	
									1911	Condorcet									*Ersatz Elsass*	2,600
									1911	Voltaire...									*Ersatz Hessen*	
										Building:—										
										Dunkerque	26,500									
										Strasbourg										
										1 *battleship,**	35,000									
				1 ship.	26,100					12 ships, including 3 building.	273,925		4 ships.	86,532		3 ships.	69,878		8 ships, including 2 building	121,120

* One further battleship of 35,000 tons is projected.

TABLE VI.—CRUISERS.

NOTE.—Vessels under construction in italics. Cruisers marked * have guns above 6·1-in.

BRITISH EMPIRE.		
Speed.	Name.	Standard Displacement.
kts.		tons.
32¼	London *	9,750
32¼	Devonshire *	
32¼	Shropshire *	9,730
32¼	Sussex *	
31½	Berwick *	9,750
31½	Cornwall *	9,750
31½	Kent *	9,850
31½	Suffolk *	9,800
31½	Cumberland *	9,750
31½	Australia (A) *	9,870
31½	Canberra (A) *	9,850
33	Emerald	7,550
33	Enterprise	7,580
30½	Effingham *	9,770
30½	Frobisher *	9,860
29½	Hawkins *	9,800
29	Despatch	4,850
29	Diomede (N.Z.)	
29	Durban	
29	Delhi	
29	Dunedin (N.Z.)	
29	Danae	
29	Dauntless	
29	Dragon	
29	Capetown	4,200
29	Cairo	
29	Calcutta	
29	Carlisle	
29	Colombo	
29	Cardiff	4,290
29	Coventry	
29	Curlew	
29	Ceres	
29	Curacoa	
29	Caledon	4,180
29	Calypso	
29	Caradoc	

UNITED STATES.		
Speed.	Name.	Standard Displacement.
kts.		tons.
33·7	Omaha	7,050
	Milwaukee	
	Cincinnati	
	Raleigh	
	Detroit	
	Richmond	
	Concord	
	Trenton	
	Marblehead	
	Memphis	
21	Rochester ‡*	7,350
32½	Salt Lake City *	9,100
32½	Pensacola *	
32	Northampton *	9,050
32½	Chester *	9,200
	Louisville *	9,050
	Chicago *	9,300
	Houston *	9,050
	Augusta *	9,050
32·7	Portland *	9,800
	Indianapolis *	
	New Orleans *	9,950
	Astoria *	
	Minneapolis *	
	Tuscaloosa *	
	San Francisco *	9,975 (estimated)
	Quincy *	
	Vincennes *	
	Savannah	9,950
	Nashville	
	Brooklyn	10,000
	Philadelphia	

JAPAN.		
Speed.	Name.	Standard Displacement.
kts.		tons.
33	Nachi *	10,000
33	Myoko *	
33	Ashigara *	
33	Haguro *	
33	Kako *	7,100
33	Furutaka *	
33	Kinugasa *	
33	Aoba *	
33	Naka	5,195
33	Sendai	
33	Jintzu	
33	Nagara	5,170
33	Kinu	
33	Abukuma	
33	Natori	
33	Isudzu	
33	Yura	
33	Kuma	5,100
33	Tama	
33	Kitakami	
33	Kiso	
33	Oi	
33	Yubari	2,890
31	Tenryu	3,230
31	Tatsuta	
26	Yahagi	4,400
26	Hirado	
33	Takao *	9,850
33	Atago *	
33	Chokai *	
33	Maya *	
	Mogami	8,500
	Mikuma	
33		
33	*Susuya*	
—	*Kumano*	
	Tone	
	1 Projected	

FRANCE.		
Speed.	Name.	Standard Displacement.
kts.		tons.
33·2	Tourville *	10,000
	Duquesne *	
31·3	Suffren *	10,000
33	Duguay-Trouin	7,249
33	La Motte Picquet	
33	Primauguet	
34	Emile Bertin	5,886
26	Strasbourg (ex-Regensburg)	4,723
24·4	Waldeck Rousseau *	12,617
	Ernest Renan *	12,234
	Jules Michelet *	11,072
22·8	Colbert *	10,000
32	Foch *	
32	Dupleix	
32	Jeanne d'Arc	6,496
26		
	Algerie *	10,000
31	La Galissonnière	
31	*Jean de Vienne*	7,600
31	*Gloire*	
31	*Marseillaise*	
31	*Montcalm*	
31	*Georges Leygues*	
31		

ITALY.		
Speed.	Name.	Standard Displacement.
kts.		tons.
35	Trento *	10,000
35	Trieste *	
27	Taranto	3,184
28	Quarto	2,903
27½	Ancona	3,838
27½	Bari	3,248
27	Brindisi	2,756
27	Venezia	
22	Libia	3,700
22½	San Giorgio *	9,232
23	San Marco *	9,350
27½	Pisa *	8,760
19	F. Ferruccio	6,299
37	Alberto da Guissano	5,069
37	Alberico di Barbiano	
37	Bartolomeo Colleoni	
37	Giov. della Bande Nere	
32	Zara *	10,000
32	Fiume *	
32	Gorizia *	10,000
37	Armando Diaz	5,008
37	Luigi Cadorna	
32	Pola *	10,000
35	Bolzano *	10,000
37	Attendolo	5,857
37	Montecuccoli	
36½	E. Filliberto	6,791
36·5	*E. di Savoia*	6,791
35	*Guiseppe Garibaldi*	7,874
35	*Duca degli Abbruzzi*	

SOVIET UNION.		
Speed.	Name.	Normal Displacement.
kts.		tons.
29	Profintern	6,600
	Chervonaya-Ukrainia	6,934
16	Komintern †	6,338
18	Aurora	5,622
	Krasni * Kavkas	8,030

GERMANY.		
Speed.	Name.	Standard Displacement.
kts.		tons.
29	Emden	5,400
32	Königsberg	6,000
32	Karlsruhe	
32	Köln	
32	Leipzig	
32	Nürnberg	
	G *	10,000
	H *	10,000

(A) Australian Navy. (N.Z.) New Zealand Navy. † Under French protection at Bizerta (disarmed). ‡ Listed for disposal.

TABLE VI.—CRUISERS (*continued*).

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Normal Displacement.	Speed.	Name.	Displacement.
kts.		tons.	kts.		tons.	kts		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.
29	Constance ..	3,920		Wichita * ...	10,000															
29	Castor			Phœnix																
30	Vindictive* ..	9,996		Boise																
25½	Adelaide (A)...	5,100		Honolulu ...																
25½	Brisbane (A)...	5,120		CL 49																
32¼	Norfolk* ...	9,850		CL 50																
32¼	Dorsetshire* ...	9,900																		
32¼	York*	8,250																		
32	Exeter*	8,390																		
32½	Leander	7,140																		
32½	Achilles	7,030																		
32½	Neptune ...	7,030																		
	Orion	7,070																		
	Ajax	6,840																		
	Sydney (A) ...	6,830																		
32¼	Arethusa ...	5,220																		
32¼	Galatea	5,220																		
32½	*Amphion* ...	7,000																		
32½	*Apollo*																			
32¼	*Penelope* ..	5,200																		
32¼	*Aurora*																			
32	*Southampton*	9,000																		
	Newcastle ...																			
	Glasgow... ...																			
	Sheffield																			
	Birmingham																			
	Liverpool ...																			
	Manchester ..																			
	Gloucester ...																			
		459,216			340,275			249,055			190,375			197,362			33,524			55,400
	† 66 ships, including 11 building and Gloucester not yet ordered.			38 ships, including 12 building.			37 ships, including 3 building (and 1 projected).			‡ 22 ships, including 5 building.			30 ships, including 3 building.			5 ships.			8 ships, including 2 building.	

(A) Australian Navy.

† One cruiser minelayer (Adventure, 6,740 tons) in addition.

‡ To this French cruiser tonnage must be added 32 vessels of an average displacement of 2,432 tons built and building. These vessels are classed in France (as France did not ratify the London Naval Treaty) as contre-torpilleurs; but being of a displacement of over 1,850 tons they automatically fall under the category of cruisers in lists of Fleets compiled by those Powers which ratified that Treaty.

TABLE VII.—AIRCRAFT AND SEAPLANE CARRIERS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.
		tons.			tons.			tons.			tons.			tons.						
1916	Furious *	22,450	1912	Langley** ...	11,500	1920	Notoro ‡	14,050	1914	Béarn † ...	22,146	1923	Miraglia‡‡	4,960						
1917	Argus ...	14,450	1925	Lexington *..	33,000	1922	Kamoi ‡	17,000	1929	Commandant Teste ††	10,000									
1917	Pegasus ‖	6,900	1925	Saratoga * ...		1921	Hosho ...	7,470												
1914	Hermes ...	10,850				1925	Akagi *	26,900												
1919	Eagle † *	22,600	1933	Ranger ...	14,500	1921	Kaga †	26,900												
1918	Courageous	22,500				1931	Ryujo	7,100												
1928	Albatross (A)	4,800		*Yorktown* ... *Enterprise* ...	19,900		*Soryu* ...	10,050											One vessel projected.	
1916	Glorious *	22,500		*CV 7*	14,700		*Chitose* ‖													
	Ark Royal	22,000																		
	9 ships. including one building.	149,050		7 ships. including 3 building.	146,500		8 ships. including 2 building Another is projected.	109,470		2 ships.	32,146		1 ship.	4,960		Nil	—		Nil	—

* Completed as battle-cruisers 1917; converted to aircraft-carriers under the Washington Treaty.
† Designed as battleships
‖ Seaplane carrier, used for experimental work. Not counted as part of the war fleet, under the terms of the London Naval Treaty.
** Converted from collier Jupiter in 1921.
†† Aviation transport, a special type under the terms of London Naval Treaty.
‡ Seaplane carriers converted from oilers.
(A) Seaplane carrier, Australian Navy.
‡‡ Seaplane carrier.

NOTE.—Vessels of which the names are printed in italics are under construction.

BRITISH AND FOREIGN AIRCRAFT TYPES

BRITISH NAVAL AIRCRAFT TYPES.

Fleet Air Arm.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P., Make.	Max. speed, m.p.h.	Ceiling, in feet.
Hawker Nimrod.	Single-seater Fighter. Float or Ship Plane.	480 Rolls-Royce "Kestrel."	192·5	26,900
Hawker Osprey.	Two-seater Fighter. Reconnaissance.	525 Rolls-Royce "Kestrel."	174·5	22,850
Fairey Seal.	Fleet Spotter Reconnaissance. 2–3 seater.	525 Armstrong-Siddeley "Panther."	140	17,000
Fairey Seal.	Fleet Spotter Reconnaissance. 2–3 seater. Seaplane.	525 Armstrong-Siddeley "Panther."	128·7	13,900
Fairey III F.	Fleet Spotter Reconnaissance. 2–3 seater. Seaplane.	539 Napier "Lion."	130	12,700
Blackburn Baffin.	Fleet Torpedo Carrier. Two-seater.	587 Bristol "Pegasus."	131·5	15,000
Blackburn Shark.	Torpedo Spotter Reconnaissance. Three-seater.	720 Armstrong-Siddeley "Tiger."	(Details not available.)	
Supermarine Seagull V.	Fleet Spotter Reconnaissance. Three-seater.	587 Bristol "Pegasus"	(Details not available.)	

R.A.F. SHORE-BASED AIRCRAFT WHICH MAY BE EMPLOYED IN CO-OPERATION WITH NAVAL FORCES.*

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Vickers Vildebeest.	Torpedo Carrier and Bomber. Two-seater.	587 Bristol "Pegasus."	141	16,250
Supermarine Southampton II.†	Reconnaissance Flying Boat. Five-seater.	Two 488 Napier "Lion."	95	5,950
Supermarine Scapa.	Reconnaissance Flying Boat. Five-seater.	Two 525 Rolls-Royce "Kestrel."	143	14,950
Blackburn Iris V.	Reconnaissance Flying Boat. Five-seater.	Three 825 Rolls-Royce "Buzzard."	129	12,300
Short Singapore III.	Reconnaissance Flying Boat. Five-seater.	Four 525 Rolls-Royce "Kestrel."	136	13,600
Blackburn Perth.	Reconnaissance Flying Boat. Five-seater.	Three 825 Rolls-Royce "Buzzard."	122	10,000
Short Rangoon.	Reconnaissance Flying Boat. Six-seater.	Three 508 Bristol "Jupiter."	112·3	10,300
Short R6/28.	Reconnaissance Flying Boat. Ten-seater.	Six 825 Rolls-Royce "Buzzard."	(Experimental. Data not available.)	

* R.A.F. bombers of the Home Defence Air Force are also occasionally employed in Combined Exercises.

† Now obsolescent and being gradually replaced.

AIRCRAFT ENDURANCE.

Hawker Nimrod, 3¼ hours at 114 m.p.h.; Hawker Osprey, 4¼ hours at 107 m.p.h.; Fairey Seal, 4½ hours at 103 m.p.h.; Fairey IIIF, 5½ hours at 98 m.p.h.; Blackburn Baffin, 3½ hours at 95 m.p.h.

Supermarine Southampton II, 8·4 hours at 80 m.p.h.; Short Rangoon, 7 hours at 93 m.p.h.

DISTRIBUTION OF F.A.A. AIRCRAFT IN THE FLEET AT THE BEGINNING OF 1936.

Aircraft Carrier.	Fighter.	Torpedo-Bomber.	Torpedo-Spotter-Reconnaissance.	Spotter-Reconnaissance.	Total.
Courageous (Home).	3 Osprey. 9 Nimrod.	12 Baffin.	12 Shark.	12 Seal.	48
Furious (Home).	3 Osprey. 6 Nimrod.	12 Baffin.	—	12 IIIF.	33
Eagle (Reserve).	—	—	—	—	—
Hermes (China).	6 Osprey.	—	—	9 Seal.	15
Glorious	3 Osprey.	—	—	12 Seal.	48
	9 Nimrod.	12 Baffin.	—	12 IIIF.	—
					144

SHIPS FITTED WITH CATAPULTS AND THE STATION TO WHICH THEY BELONG.

Home Fleet.			
Renown.	1 IIIF.		
Nelson (with no catapult).	1 Seagull V.		
Leander, Orion, Neptune, Achilles.	2 Osprey each.		
Ramillies, Royal Sovereign.	1 Osprey each.	12	
Mediterranean Fleet.			
Arethusa, Galatea, London, Sussex, Devonshire, Shropshire.	1 Osprey each.		
Valiant, Barham.	1 IIIF each.	8	
China Fleet.			
Kent, Cornwall, Berwick, Cumberland, Suffolk, Dorsetshire.	1 Osprey each.	6	
West Indies and South Africa.			
York.	1 IIIF.		
Exeter.	2 IIIF.		
Ajax.	2 Osprey.	5	
East Indies.			
Emerald, Enterprise.	1 Osprey each.		
Norfolk.	1 IIIF.	3	
	34		
			34
			178

It will be seen that there are 13 Squadrons in the Aircraft Carriers. The Catapult aircraft are organised into 7 Flights.

FOREIGN NAVAL AIRCRAFT TYPES.

United States Naval Air Service.

Aircraft, Heavier-than-Air.

Maker, Number, Name,	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Martin. PM-1.	Patrol Flying Boat. Crew of 5.	Two 525 " Cyclone."	120	12,000
Boeing. F4B-4.	Single-seater Fighter.	500 " Wasp."	187	27,500
Curtiss. F11C-3.	Single-seater Fighter.	700 " Cyclone."	202	—
Curtiss. BF2-C1.	Single-seater Bomber Fighter.	"Cyclone."	244	25,800
Grumman. FF-1.	Two-seater Fighter.	700 "Cyclone."	222	—
Douglas. PD-1.	Coastal Patrol Flying Boat. Crew of 4.	Two 525 " Cyclone."	121	11,600
Douglas. P2D-1.	Torpedo Bomber and G.P. Seaplane. Three-seater.	Two 575 " Cyclone."	135	—
Consolidated. P2Y-1.	Patrol Flying Boat. Crew of 5.	Two 600 "Cyclone."	130	—
Martin. BM-2. Diving Bomber.	High performance Bomber. Two-seater.	525 " Hornet."	140	18,000
Vought. 03U-4. "Corsair."	Two-seater land, sea, or Amphib. Observation.	500 " Wasp."	—	—
Grumman. F2F-1.	Single-seater Fighter, Dive Bomber.	750 "Cyclone."	235	26,000
Vought. SBU-1.	Two-seater Scout Bomber.	700 "Twin-Wasp."	Over 200 (stated).	—
Great Lakes. BG-1.	Two-seater Dive Bomber.	800 "Twin-Wasp."	180	23,800
Consolidated. P3Y-1.	Patrol Flying Boat. Crew of 8.	Two 800 "Twin-Wasp."	170	—

All engines are air-cooled. " Wasp " and " Hornet " engines are made by Pratt and Whitney. " Whirlwind " and " Cyclone " engines are made by Curtiss-Wright.

United States—*continued.*

AIRCRAFT, LIGHTER-THAN-AIR.

The "Los Angeles" (LZ–126) was built by Zeppelin Co., of Friedrichshafen, and flown across the Atlantic (October, 1924) by a German crew for delivery to the United States. This airship has now been decommissioned. The ZMC–2 was manufactured by the Aircraft Development Corporation, and delivered to the U.S. Navy in September, 1929. She is used at Lakehurst for training.

The "Macon" (ZRS–5), built by the Goodyear Zeppelin Corporation, was delivered to the U.S. Navy in the summer of 1933. She has accommodation for five scouting aircraft, and is provided with trapeze gear enabling the aircraft to return to the airship. The "Akron" (ZRS–4), similar to the "Macon," was lost at sea in April, 1933.

The United States have the following shore naval bases:—Pensacola, Florida (Training); San Diego, California (Fleet Base); Hampton Roads, Viriginia (Fleet Base); Lakehurst, New Jersey (Lighter-than-air craft); Pearl Harbour, Hawaii (Fleet Base); Coco-Solo, Canal Zone (Fleet Base); Anacostia, D.C. (Experimental); Seattle, Washington (Reserve Training Base); Sunnyvale, California (Lighter-than-air craft).

Japanese Naval Air Service.

Type.	Crew.	Engine and H.P.	Weight, lbs.	Speed, m.p.h.
Fighter.				
Nakajima 90.	1	Jupiter, 450	2,200	193
Reconnaissance.				
Navy 14–II.	3	Lorraine, 450	6,050	111
Navy 15.	2	Hispano, 300	4,290	114
Navy 90–II.	2	Jupiter, 450	3,888	—
Navy 90–III.	3	Jupiter, 450	6,750	—
Bomber.				
Navy 13	3	Napier, 450	6,270	125
Navy 89	3	Hispano, 650	6,750	—
Navy 92	3	Hiro, 650	6,700	150
Flying Boat.				
Navy 15	4	2 Lorraine, 450	12,815	89
Navy 90–I.	6	3 Hispano, 700	26,400	137
Short 90–II.	6	3 Rolls-Royce, 800	28,600	137

The Hawker "Nimrod" single-seater fighter has been tested and the construction licence purchased from England.

*Lighter-than-air craft are based on Kasumigaura. There is one airship built in Japan in 1929 which is reported to be of 7,000 cubic metres capacity and 250 feet long. They also have two "Blimps."

* Believed to be in process of being dismantled.

French Naval Air Service.

Lighter-than-air craft activities received a severe set-back when the "Dixmude" (ex-German L27) was lost with all hands off the coast of Sicily on December 20, 1923. The French Navy is now developing two classes of airship, the "Vedettes" and the "Escorteurs." The "Vedettes," of which there are nine, are of about 125,000 cubic feet capacity, speed of about 40 m.p.h., a crew of four, and endurances varying from 15 to 25 hours. The "Escorteurs," of which there are four, are of about 350,000 cubic feet, have a speed of about 40 m.p.h., a crew of six, and an endurance of about 40 hours.

The bases and aerodromes of the Naval Air Service are as follows :

1st Region (Cherbourg).—Chantereyne (Escad. 1T1 and 1B1, Seaplanes); (Escad. E2 and 1S1 Flying Boats).

2nd Region (Brest).—Lanion (Escad. 2S1 and E4, Flying Boats); Brest (Captive Balloons); Rochefort (Training); Hourtin (Training).

3rd Region (Toulon).—St. Raphael (Experimental) and Escads. E5 and E6 (Flying Boats); Berre (Escads. 3B1, 3B2, 4T1, Seaplanes, E1 and E5, Flying Boats); Hyeres (Landplanes), 3C1; 3S1 (Flying Boats); Marignano, 3C2, 3C3 (Landplanes).

4th Region (Bizerta).—Karouba (Escads. 4B1, 4B2, 4B3, Seaplanes; E7, 4S1, Flying Boats); Bizerta (Captive Balloons).

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, Endurance in hours.
Breguet "Bizerte" Flying Boat.	Long Reconnaissance 5–6.	Three 650 "Gnome-Rhone."	130	24,000 10
Breguet "Calcutta" Flying Boat.	Long Reconnaissance 5	Three 450 "Gnome-Rhone."	110	16,000 9
C.A.M.S. 37 Flying Boat.	Short Reconnaissance 3	600 "Hispano."	108	14,760 5
C.A.M.S. 55 Flying Boat.	Long Reconnaissance 3–5.	Two 600 "Hispano."	130	14,700 7
L.E.O.-S.A.F. 371 "Dewoitine" Landplane.	Single-seater Fighter Aircraft Carrier "Bearn."	690 "Gnome-Rhone."	236	36,000 2
Gourdou-Lesseure 810 Float Seaplane.	Spotter Reconnaissance 2	450 "Gnome-Rhone."	120	16,500 5
Latecoere 29 Float Seaplane.	Torpedo Bomber 3	650 "Hispano."	129	15,500 4

French Naval Air Service—*continued.*

Maker, Number, Name.	Type. Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, Endurance in hours.
Latecoere 300 "Croix du Sud" Flying Boat.	Long Reconnaissance 4	Four 650 "Hispano."	130	15,000 10
L.E.O. 25 Float Seaplane.	Bomber 4	Two 500 "Hispano."	155	21,000 4½
Levasseur P.L.7 Landplane.	Bomber 2–3 seater Avion marine type, can alight on water.	600 "Hispano."	108	14,000 5
Levasseur P.L.15 Float Seaplane.	Bomber 2	600 "Hispano."	125	14,000 4
Levasseur P.L.101 Landlane.	Short Reconnaissance 3 Avon Marine Type.	600 "Hispano."	124	16,000 3
Loire-Nieuport 70 "Loire" Flying Boat.	Long Reconnaissance 5	Three 500 "Hispano."	130	19,864 9

Italian Naval Air Service.

Lighter-than-air craft are not used in the Italian Air Force.

Maker, Name, Number.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling. Endurance in hours.
Piaggio P6ter. Floatplane.	Two-seater Reconnaissance.	410 "Fiat" A20.	121	11,650 5
Macchi. M41bis. Flying Boat.	Single-seater Fighter.	410 "Fiat" A20.	159	20,100 3′ 5″
Fiat. CR20. Floatplane.	Single-seater Fighter. All metal.	410 "Fiat" A20.	159	18,470 3
Savoia. S62bis. Flying Boat.	Three-seater Reconnaissance.	750 "Isotta Fraschini" (Asso.).	140	14,760 5 normal
Savoia. S59bis. Flying Boat.	Two-seater Reconnaissance.	500 "Isotta Fraschini" (Asso.).	130	14,000 4
Savoia. S55. Monoplane. Flying Boat.	Five-seater Twin Hull Reconnaissance or Bomber.	Two 500 "Isotta Fraschini."	118	9,200 4
Macchi. M18. Flying Boat.	Two-seater Reconnaissance.	200–250 "Isotta Fraschini" Semi (Asso.).	107	12,500 4
Cant 25. Flying Boat.	Single-seater Fighter.	410 "Fiat" A20.	150	18,000 4
M.F.4. Flying Boat.	Three-seater Reconnaissance Monoplane.	500 Bristol Jupiter.	121	14,500 6
Savoia. S78. Flying Boat.	Two-seater Reconnaissance Bomber.	800 "Isotta Fraschini."	152	14,000
Cant. Z501. Flying Boat.	Four-seater Bomber.	850 "Isotta Fraschini."	149	18,000

The wearing of parachutes of the "Salvator" type is compulsory for all occupants of Service Aircraft. Nearly all aircraft carry W/T transmitting and receiving sets, and a few are fitted with R/T. Italy's ship-borne aircraft are chiefly flying boats and are of various types, including the Cant 25, the M.F.4, and the Macchi M.18.

BRITISH AND FOREIGN ORDNANCE TABLES

U

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

Tables Corrected by the Manufacturers, March, 1936.

NAVAL GUNS AND MOUNTINGS.

		40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	57 mm. 6-pdr.	4-in. 101·6 mm.	4-in. 101·6 mm.	4·7-in. 120 mm.	4·7-in. 120 mm.	5·118-in. 130 mm.	5·5-in. 139·7 mm.	5·906-in. 150 mm.
System		Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	ins.	1·575	1·575	1·575	1·85	2·244	4	4	4·724	4·724	5·118	5·5	5·906
do. do.	mm.	40	40	40	47	57	101·6	101·6	120	120	130	139·7	150
Length of Bore	cals.	39·37	50	50	50	50	45	50	45	50	52	50	50
		lb.	lb.	lb.	c q. lb.	c. q.	c. q.	c. q.	t. c.	t. c. q.	t. c.	t. c.	t. c.
Weight of Gun		590	655	1,433	5 3 14	9 1	36 0	40 0	2 19	3 6 3	4 8	4 13	7 4
do. do.	kg.	268	297	650	298	470	1,830	2,032	3,000	3,391	4,470	4,740	7,315
Weight of Projectile . . .	lb.	2	2	2·2	3·3	6	31	31	48·5	48·5	68	79·37	100
do. do. . . .	kg.	0·91	0·91	1	1·5	2·72	14·06	14·06	22·0	22	30·85	36	45·4
Muzzle Velocity	f.s.	2,000	2,360	2,625	2,800	2,600	2,700	3,000	2,789	3,000	3,000	3,000	2,940
do. do.	m.s.	600	720	800	853	792	823	914	850	915	915	914	896
Muzzle Energy	f.t.	54	67	105	180	280	1,565	1,935	2,616	3,025	4,245	4,953	5,995
do. do.	m.t.	17·0	20·4	32	55·75	86·7	485	600	810	935	1,315	1,535	1,857
Penetration (W.I. at muzzle).	ins.	..	..	..	6·7	7·5	13·6	16	16·6	18·0	20	22	23
do.	mm.	..	..	..	170	190	345	405	420	460	510	560	585
Rounds per Minute		200	200	130—140	30	28	18	15	12	12	..	..	..
		lb.		lb.	c. q. lb.	c. q. lb.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q. lb.	t. c. q. lb.	t. c. q. lb.
Weight of Mounting and Shield		1,676	..	2,128	11 1 23	17 3 10	2 18 3	3 5 1	4 19 3	7 15 1	9 0 1 0	9 2 0 0	14 5 3 0
do. do. do.	kg.	760	..	965	586	906	2,985	3,315	5,067	7,887	9,158	9,246	14,517
		..	..	..	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c q. lb.	t. c. q. lb.	t. c. q. lb.
Weight of Shield		..	..	..	1 0 20	1 2 10	7 2 0	14 1 13	7 3 0	18 3 21	19 0 0	1 2 0 0	3 4 0 0
do. do.	kg.	..	..	..	60	80	380	730	394	962	965	1,188	3,250
Thickness of Shield	ins.	..	..	..	·22	·25	·144	·25	·144	·144	·144	·1875	·625 & ·375
do. do.	mm.	..	..	..	5·6	6·35	3·65	6·35	3·65	3·65	3·65	4·76	16 & 9·5
Angle of Elevation . . .	deg.	85	..	90	20	20	30	30	35	45	45	35	45
Angle of Depression . . .	deg.	5	..	5	20	10	10	10	10	10	10	10	10

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. NAVAL GUNS AND MOUNTINGS—*continued.*

		6-in. 152 mm.	6-in. 152 mm.	8-in. 203 mm.	8-in. 203 mm.	8-in. 203 mm.	9·2-in. 234 mm.	10-in. 254 mm.	12-in. 305 mm.	13·5-in. 343 mm.	14-in. 356 mm.	15-in. 381 mm.	16-in. 406 mm.
Diameter of Bore	ins.	6	6	8	8	8	9·2	10	12	13·5	14	15	16
do. do.	mm.	152·4	152·4	203·2	203·2	203·2	233·7	254	304·8	342·9	355·6	381	406·2
Length of Bore	cals.	45	50	45	50	55	50	50	50	45	50	45	45
		t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.
Weight of Gun		6 10	6 17 2	14 0	15 14	16 10	28 16 2	26 1	43 10	66 0	80 0	87 0	105 0
do. do.	kg.	6,605	6,985	18,228	15,940	16,765	29,290	26,470	44,200	67,060	81,284	88,400	106,685
Weight of Projectile	lb.	100	100	250	256	256	380	500	850	1,400	1,560	1,951	2,000
do. do.	kg.	45·36	45·4	113·4	116·0	116·0	172·37	226·8	385·6	635	707·6	885	907·2
Muzzle Velocity	f.s.	2,850	3,000	2,845	3,000	3,150	3,000	2,933	2,933	2,500	2,475	2,500	2,650
do. do.	m.s.	869	915	867	914	960	914	894	894	762	754	760	808
Muzzle Energy	f.t.	5,630	6,240	14,030	15,976	17,615	23,714	29,825	50,705	60,675	66,260	84,550	97,390
do. do.	m.t.	1,745	1,930	4,345	4,950	5,445	7,340	9,235	15,705	18,790	20,520	26,185	30,160
Penetration (W.I. at muzzle)	ins.	22	24	31	34·5	38	38·8	41·7	50·3	51·5	51·65	55	59
do.	mm.	560	610	785	875	965	985	1,060	1,280	1,310	1,310	1,400	1,500
Rounds per Minute		10	..	5	6	6	4	3	2	1·5	1·5	..	1·2
		t. c. q.	t. c. q. lb.	t. c.	t. c.	t. c.	t.	t.	t.	t.	t.	t.	t.
Weight of Mounting and Shield		12 9 2	12 1 0 0	144 10	147 10	149 10	257	287	431	558	588	844	1,270
do. do. do.	kg.	12,675	12,245	146,800	150,000	152,000	261,100	291,600	438,000	567,000	597,500	857,500	1,290,000
		t. c. q. lb.	t. c. q. lb	t.	t.	t.	t.	t.	t.	t.	t.	t.	t.
Weight of Shield		4 4 3 16	3 4 0 0	24	24	24	102	115	150	192	191	315	670
do. do.	kg.	4,315	3,250	24,400	24,400	24,400	103,600	117,000	153,400	195,100	194,000	320,000	680,700
Thickness of Shield	ins.	1·5 & 1	·625 & ·375	1 & ·75	1 & ·75	1 & ·75	8, 7, 3 & 2	6, 4 & 1·5	13, 11 & 3	11, 4 & 3	10, 9 & 3	15, 12, 11 & 5	15, 11, 8, 4 & 3
do. do.	mm.	38 & 25·4	16 & 9·5	25 & 20	25 & 20	25 & 20	203, 178, 75 & 50	152, 102, & 38	330, 280, & 75	280, 102, & 75	254, 230, & 75	381, 305, 280, 127	381, 280, 203, 102 & 75
Angle of Elevation	deg.	30	35	70	70	70	15	40	15	20	25	30	40
Angle of Depression	deg.	5	10	3	3	3	5	5	5	5	5	5	5

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. HOWITZERS AND FIELD GUNS.

		2·953-in. 75 mm. Field.	2·953-in. 75 mm. Field.	4·134-in. 105 mm. Field Howr.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	5-in. 127 mm. Field.	5·9-in. 150 mm. Howr.	6-in. 152 mm. Field.	8-in. 203 mm. Railway.	8·268-in. 210 mm. Semi-Mobile.	12-in. 305 mm. Railway.	15-in. 381 mm. Railway.
Diameter of Bore	ins.	2·953	2·953	4·134	4·134	4·134	4·134	4·134	5	5·9	6	8	8·268	12	15
do. do.	mm.	75	75	105	105	105	105	105	127	150	152	203	210	305	381
Length of Bore	cals.	30	40	21	26	35	45	50	41	21	45	50	40	50	45
Weight of Gun		c. q. 7 3	c. q. 11 3	c. q. 11 2	c. q. 12 0	t. c. q. 1 5 0	t. c. q. 1 13 0	t. c. q. 1 14 0	t. c. q. 2 11 2	t. c. q. 1 11 0	t. c. q. 5 12 1	t. c. 15 5	t. c. 10 19	t. c. 43 10	t. c. 87 0
do. do.	kg.	394	597	584	610	1,270	1,675	1,725	2,615	1,575	5,700	15,500	11,125	44,200	88,400
Weight of Projectile	lb.	14·33	14·33	26·45	33·07	34·274	35·27	35·27	56	90·4	100	256	286·6	850	1,951
do. do.	kg.	6·5	6·5	12·0	15·0	15·5	16·0	16	25·5	41·0	45·4	116	130	385·6	885
Muzzle Velocity	f.s.	1,952	2,461	1,608	2,000	2,454	2,690	2,953	2,700	1,903	2,870	2,900	2,608	2,933	2,500
do. do.	m.s.	595	750	490	610	747	820	800	823	580	875	884	795	894	760
Muzzle Energy	f.t.	379	602	474	915	1,470	1,770	2,133	2,830	2,270	5,730	14,930	13,515	50,705	84,550
do. do.	m.t.	117	186	147	284	448	548	659	877	703	1,774	4,625	4,185	15,705	26,185
Rounds per Minute		25	..	10	10	10	..	10	..	4	4	4	3	5 in 2 mins.	2
Weight of Mounting and Shield		t. c. q. lb. 1 1 1 25	t. c. 1 4	c. q. lb. 19 1 16	t. c. q. lb. 1 9 2 0	t. c. q. 2 7 0	t. c. 2 19	t. c. q. 2 16 0	..	t. c. q. lb. 3 10 3 0	t. c. q. lb. 7 13 3 20	t. c. 62 8	tons 28	tons 175	tons 275
do. do. do.	kg.	1,091	1,219	985	1,498	2,388	2,997	*2,842	..	3,594	7,820	63,400	28,450	177,800	279,400
Weight of Shield		c. q. lb. 1 2 10	..	c. q. lb. 1 2 24	c. q. lb. 0 3 0	NoShield	NoShield	NoShield	..	No Shield	No Shield	No Shield	No Shield	No Shield	No Shield
do. do.	kg.	80·7	..	87	38	..	..	..	..	..	..	..	..	..	..
Thickness of Shield	ins.	116·16	..	·125	·16	..	..	..	..	..	..	..	..	..	..
do. do.	mm.	2·94	..	3·2	4·06	..	..	..	..	..	..	..	..	..	..
Angle of Elevation	deg.	40	45	40	45	45	45	45	..	45	45	50	50	35½	40
Angle of Depression	deg.	5	8	5	5	5	0	5	..	0	5	0	2	0	0

		TANK GUNS.		FOR VICKERS CARDEN LOYD VEHICLE.		MOUNTAIN HOWITZERS.		LANDING GUN.
		57 mm. 6-pdr. Semi-Auto.	47 mm. 3-pdr. Semi-Auto.	47 mm. 3-pdr.		2·953-in. (75 mm.) Jointed.	4·134-in. (105 mm.) Jointed.	3-in. (76·2 mm.)
Diameter of Bore	ins.	2·244	1·85	1·85		2·953	4·134	3
do. do.	mm.	57	47	47		75	105	76·2
Length of Bore	cals.	27	35	21		18	11	22
Weight of Gun		c. q. lb. 2 2 14	c. q. lb. 2 2 0	lb. 165		c. q. lb. 3 2 4	c. q. lb. 5 0 0	c. q. lb. 3 3 4
do. do.	kg.	133	127	74·8		179·8	254	192
Weight of Projectile	lb.	6	3·3	3·3		14·33	26·45	12·5
do. do.	kg.	2·72	1·5	1·5		6·5	12	5·67
				A.P. Shell.	H.E. Shell.			
Muzzle Velocity	f.s.	1,200	1,854	1,600	984	1,450	1,148	1,640
do. do.	m.s.	366	565	488	300	442	350	500
Muzzle Energy	f.t.	60	79	58·6	22·2	210	242	233
do. do.	m.t.	18·6	24·5	18·1	6·9	65·0	74·5	72·0
Rounds per Minute		..	..			18	10	25
Weight of Mounting and Shield		c. q. lb. 2 3 21	c. q. lb. 2 2 0			c. q. lb. 9 1 14	c. q. lb. 11 1 21	c. q. lb. 10 0 0
do. do. do.	kg.	149	127			476	581	508
Weight of Shield		..	..			c. q. lb. 1 1 0	c. q lb. 1 2 10	c. q. lb. 1 1 15
do. do.	kg.	..	..			50·8	81	70
Thickness of Shield	ins.	..	..			·144	·16	·192
do. do.	mm.	..	..			3·6	4·0	4·875
Angle of Elevation	deg.	30	30			45	45	23
Angle of Depression	deg.	10	10			10	5	10

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. INFANTRY GUNS.

		44–60 mm.			47 mm.			65 mm.			70 mm. with 25·4 mm. S.C. Tube, on Platform Carriage.	
		44 mm. Barrel.		60 mm. Barrel.	Armour-Piercing Ammunition.		High-Explosive Ammunition.		High Explosive Ammunition.		70 mm. Barrel.	25·4 mm. S.C. Tube.
Diameter of Bore	ins.	1·73		2·36		1·85			2·559		2·756	1·0
do. do.	mm.	44		60		47			65		70	25·4
Length of Bore	cals.	30		20		21			16		15	50
		Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Gun and Mechanism.	S.C. Tube.
Weight of Gun		75 lb.	50 lb.	26 lb.	75 lb.	68 lb.	28 lb.	88 lb.	62 lb.	38 lb.	172 lb.	56·5 lb.
do. do.	kg.	34	22·7	11·8	34	30·8	12·7	38	28	17	78	25·6
Weight of Projectile	lb.	2·75		5·5	3·3		3·3		8·8		8·8	0·55
do. do.	kg.	1·25		2·5	1·5		1·5		4		4	0·25
Muzzle Velocity	f.s.	1,706		732	1,600		755		820		700	2461
do. do.	m.s.	520		223	488		230		250		213	750
Muzzle Energy	f.t.	55·5		20·4	58·6		13·0		41·0		30	23·1
do. do.	m.t.	17·2		6·3	18		4		12·7		9·3	7·15
Weight of Mounting and Shield	lb.		326			397			556		558 with Platform and S.C. Tube	
do. do. do.	kg.		148			180			252		253 ,, ,, ,, ,, ,,	
Weight of Shield	lb.		—			45			106			
do. do.	kg.		..			20·4			48			
Thickness of Shield	ins.		..			0·14			0·16			
do. do.	mm.		..			3·5			4			
		44 mm. Barrel.		60 mm. Barrel.	Low Position.		High Position.	Low Position.		High Position.		
Angle of Elevation	deg.	10		20 to 60	15		45	17		45	45	15 Nominal
Angle of Depression	deg.	5		0	10		2½	10		2	10	10

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. GUNS MOUNTED ON AIRCRAFT

		* ·303-in. (7·7 mm.) for aircraft gun.	*·303-in. (7·7 mm.) Observer's gun.	*·303-in. (7·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's gun.	·5-in. (12·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's Gun.	1·457-in. (37 mm.) Observer's gun.	1·575-in. (40 mm.) Observer's gun.
System		Vickers-Armstrongs Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Recoil operated.	Vickers Semi-Auto. operated.
Diameter of Bore . .	ins.	·303	·303	·303	·5	·5	·5	1·457	1·575
do. do. . .	mm.	7·7	7·7	7·7	12·7	12·7	12·7	37	40
Length of Bore . .	cals.	72	79·2	93·7	50	62·2	72	39·5	40
Weight of Gun . .	lb.	20·5	25	26·5	45	52·5	70	200	234
do. do. . .	kg.	9·3	11·3	12	20·4	23·8	32	90·72	106
Weight of projectile .	lb.	174 grs.	174 grs.	174 grs.	565 grs.	565 grs.	690 grs.	1·457	2
do. do. .	kg.	11·3 grms.	11·3 grms.	11·3 grms.	36·6 grms.	36·6 grms.	44·7 grms.	0·666	0·91
Muzzle Velocity . .	f.s.	2,400	2,400	2,440	2,450	2,550	2,800	1950	2,300
do. do. . .	m.s.	732	732	744	746	777	853	594	700
Muzzle Energy . .	f.t.	0·9	0·9	1	3·36	3·64	5·36	40·2	73
do. do. . .	m.t.	0·28	0·28	0·31	1·04	1·125	1·66	12·45	22·6·
Rounds per Minute . . .		900–1000	650–750	900–1000	450–650	450–650	400–450	100	..
Weight of Mounting . .	lb.	5	..	..	..	..	..	102	432
do. do. . .	kg.	0·9	..	..	..	..	..	46	196
Angle of Elevation .	deg.	90	..	..	..	..	..	55	60
Angle of Depression .	deg.	90	..	..	..	..	..	40	30

MACHINE GUNS—ANTI-AIRCRAFT.

		*·303-in. (7·7 mm.)	*·303-in. (7·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)
System		Vickers Recoil operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.
Diameter of Bore	ins.	·303	·303	·5	·5	·5
do. do.	mm.	7·7	7·7	12·7	12·7	12·7
Length of Bore	cals.	93·7	72	62·2	90	72
Weight of Gun	lb.	32	22	52·5	101	70
do. do.	kg.	14·5	10	23·8	40·6	32
Weight of Projectile . .	lb.	174 grs.	174 grs.	565 grs.	690 grs.	690 grs.
do. do.	kg.	11·3 grms.	11·3 grms.	36·6 grms.	44·7 grms.	44·7 grms.
Muzzle Velocity	f.s.	2,440	2,400	2,550	3,000	2,800
do. do.	m.s.	744	732	777	914	853
Muzzle Energy	f.t.	1	0·9	3·64	6·15	5·36
do. do.	m.t.	·31	0·28	1·125	1·9	1·66
Rounds per minute		500–600	450–500	450–650	350–450	400–450

* This gun can be adapted to fire any pattern of rifle calibre ammunition.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. ANTI-AIRCRAFT GUNS.

		40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	Mobile 75 mm. 40 Calibre	Mobile 75 mm. 46 Calibre	3-inch	3-inch	4-in.	4-in.	105 mm. 45 Calibre	4·7-in.
System		Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Q.F.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Construction		Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Diameter of bore .	ins.	1·575	1·575	1·575	1·575	1·85	2·953	2·953	3	3	4	4	4·134	4·724
" " .	mm.	40	40	40	40	47	75	75	76·2	76·2	101·6	101·6	105	120
Length of bore .	cals.	39·37	50	50	50	50	40	46	45	50	45	50	45	40
		lb.	lb.	lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.
Weight of gun .		590	655	1,433	2 0 17	5 3 14	11 0 0	13 1 8	18 1 0	1 3 1	1 16 1	2 0 0	2 1 2	3 1 0
" " .	kg.	268	297	650	100	298	560	677	927	1181	1842	2032	2,110	3,100
Weight of projectile	lb.	2	2	2·2	2·205	3·3	14·33	14·33	12·5	14·33	31	31	35·274	48·5
" " .	kg.	·91	·91	1	1	1·5	6·5	6·5	5·6	6·5	14·06	14·06	16	22
Muzzle velocity .	f.s.	2,000	2,360	2,625	2,625	2,800	2,461	2,641	2,600	2,560	2,700	2,850	2,625	2,560
" " .	m.s.	600	720	800	800	853	750	805	792	780	823	869	800	780
Muzzle energy .	f.t.	54	67	105	105	180	602	695	586	650	1,565	1,740	1,685	2,205
" " .	m.t.	17	20·4	32	32	55·75	186	215	181	201	485	540	522	683
Rounds per minute .		200	200	130–140	35	30	..	..	20	25	18	18	..	12
		c. q. lb.		c. q. lb.	c. q.	c. q. lb.	t. c. q.	t. c. q.	t. c. q. lb.	t. c. q.	t. c. q. lb.	t. c. q. lb.	t. c. q.	t. c. q. lb.
Weight of mounting .		14 3 24	..	19 0 0	12 3	18 2 3	2 1 3	2 2 3	1 19 3 9	2 18 2	6 14 0 18	6 12 0 0	5 11 1	9 0 1 0
(exclusive of Gun)	kg.	760	..	965	647·6	941·1	2,121	2,172	2023·4	2425·8	6815	6706·0	5,660	9157·1
Angle of elevation .	deg.	85	..	90	90	80	90	90	90	90	90	90	90	90
Angle of depression	deg.	5	..	5	0	5	0		5	5	5	5	5	5

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. MACHINE AND AUTOMATIC GUNS.

		*·303-in. (7·7-mm.) Observer's Gun for Aircraft.	*·303-in. (7·7-mm.) Pilot's Gun for Aircraft.	*·303-in. (7·7-mm.) Land and Naval.	*·303-in. (7·7-mm.) Gun for Aircraft.	*·303-in. (7·7-mm.) for Infantry.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) Pilot's Gun for Aircraft.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) for Anti-Aircraft and Anti-Tank.	1·457-in. (37-mm.) Observer's Gun for Aircraft.	1·575-in. (40-mm.) 2-pr. Anti-Aircraft.	1·575-in. (40-mm.) 2-pr. Auto.	1·575-in. (40-mm.) 2·2-pr. Anti-Aircraft.
System		Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.
Diameter of Bore	ins.	·303	·303	·303	·303	·303	·5	·5	·5	·5	·5	·5	1·457	1·575	1·575	1·575
do. do.	mm.	7·7	7·7	7·7	7·7	7·7	12·7	12·7	12·7	12·7	12·7	12·7	37	40	40	40
Length of Bore	cals.	79·2	93·7	93·7	72	72	50	62·2	62·2	90	72	72	39·5	39·37	50	50
Weight of Gun	lb.	25	26·5	32	20·5	22	45	52·5	52·5	101	70	70	200	590	655	1,433
do. do.	kg.	11·3	12	14·5	9·3	10	20·4	23·8	23·8	40·6	32	32	90·72	268	297	650
Weight of Projectile	grs.	174	174	174	174	174	565	565	565	690	690	690	1·457	2 lb.	2 lb.	2·2 lb.
do. do.	grms.	11·3	11·3	11·3	11·3	11·3	36·6	36·6	36·6	44·7	44·7	44·7	0·666	·91 kg.	·91 kg.	1 kg.
Muzzle Velocity	f.s.	2,400	2,440	2,440	2,400	2,400	2,450	2,550	2,550	3,000	2,800	2,800	1950	2,000	2,360	2625
do. do.	m.s.	732	744	744	732	732	746	777	777	914	853	853	594	600	720	800
Muzzle energy	f.t.	0·9	1	1	0·9	0·9	3·36	3·64	3·64	6·15	5·36	5·36	40·2	54	67	105
do. do.	m t.	0·28	0·31	0·31	0·28	0·28	1·04	1·125	1·125	1·9	1·66	1·66	12·45	17	20·4	32
Rounds per minute		650–750	900–1000	500–600	900–1000	450–500	450–650	450–650	450–650	350–450	400–450	400–450	100	200	200	130–140
Weight of Mounting	lb.	..	..	..	5	..	..	..	..	..	..	..	102	1,676	..	2,128
do. do.	kg.	..	..	..	·9	..	..	..	..	..	..	..	46	760	..	965
Angle of Elevation		..	..	..	90°	..	..	..	..	..	..	..	55°	85°	..	90°
Angle of Depression		..	..	..	90°	..	..	..	..	..	..	..	40°	5°	..	5°

* This gun can be adapted to fire any pattern of rifle calibre cartridge.

BEARDMORE GUNS AND HOWITZERS.

		NAVAL.																	
Calibre	ins.	4	4	4·7	4·7	4·7	5·5	5·5	5·5	6·0	6·0	7·5	8	8	9·2	12	13·5	15	16
do.	mm.	101·6	101·6	120	120	120	140	140	140	152	152	190	203·2	203·2	234	305	343	381	406
Length of Bore	cals.	50	55	50	45	52·5	55	55	40	50	52·5	45	50	55	50	50	46	45	45
Weight of Gun	tons	2·15	2·45	3·65	3·35	3·85	8·0	6·8	5·35	7·95	8·1	13·9	17·5	19·25	29	66	77	96	107
do. do.	kg.	2,184	2,489	3,711	3,405	3,911	8,128	6,910	5,435	8,077	8,230	14,122	17,780	18,542	24,402	67,056	78,232	97,536	108,712
Weight of Projectile	lbs.	31	31	50	50	48·5	92·6	82	75	100	100	200	250	250	425	950	1,350	1,850	2,100
do. do.	kg.	14·06	14·06	22·68	22·68	22	42	37·2	34	45·36	45·36	90·72	114·2	114·2	192·8	430·9	612·4	839·2	952·5
Muzzle Velocity	f.s.	2,920	3,000	2,950	2,650	3,000	2,950	3,000	2,650	2,970	3,000	2,750	2,900	3,000	2,825	2,825	2,650	2,620	2,675
do. do.	m.s.	890	914	900	808	914·4	900	914·4	808	905·2	914·4	838	884	914	861	861	808	799	815
Muzzle Energy	f.t.	1,833	1,935	3,017	2,434	3,026	5,587	5,117	3,652	6,116	6,240	10,488	14,579	15,602	23,518	52,571	63,738	88,056	104,198
do. do.	m.t.	568	599	934	837	937	1,730	1,584	1,131	1,894	1,938	3,248	4,515	4,832	7,283	16,280	20,441	27,270	32,270

		Motor Boats or Sub-marines.	Sub-marine.	ANTI-AIRCRAFT.							TANK GUNS.	
				For Sub-marines.	Fixed.	Fixed.	Fixed.	Fixed.	Mobile.			
Calibre	ins.	3·0	4·0	3·0	3·0	4·0	4·0	4·724	3·02	3·3	1·85	2·24
do.	mm.	75	101·6	75	75	101·6	101·6	120	77	84	47	57
Length of Bore	cals.	45	40	45	45	45	50	40	47·5	42·5	30·0	23
Weight of Gun	ton	0·67	1·3	0·64	1·65	1·95	2·1	3·1	0·75	1·1	1·8 cwt.	5·6 cwt.
do. do.	kg.	686	1,321	648	1,675	1,981	2,133	3,150	762	1,120	90·7	284
Weight of Projectile	lbs.	12·5	31	16	16	31	31	48·5	17·6	21	3·25	6
do. do.	kg.	5·67	14·06	7·26	7·26	14·06	14·06	22	8·0	9·53	1·49	2·72
Muzzle Velocity	f.s.	2,200	2,250	2,100	2,590	2,600	2,850	2,560	2,175	2,300	1,750	1,525
do. do.	m.s.	670	685·8	640	790	792	869	780	663	701	533	465
Muzzle Energy	f.t.	419	1,088	489	744	1,453	1,740	2,205	577	770	69	96·7
do. do.	m.t.	130	337	151	230	450	530	672	179	238	21·6	30
				Semi-Auto.								

		ANTI-TANK.			FIELD GUNS AND HOWITZERS.									
		Infantry Guns.			Gun.	How.	How.	How.	How.	Gun.	How.	How.	Mountain H.	
Calibre I	ins.	1·85	1·575	2·24	3·3	4·134	3·3	4·5	6	6	8	9·2	3·3	
do.	mm.	47	40	57	84	105	84	112	152·4	152·4	203·2	234	84	
Length of Bore	cals.	28·5	37	24	31	20	15	20	13	35	17	17	12·25	
		cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	tons	tons	tons	tons	wts.	
Weight of Gun		1·03	0·92	0·92	7·25	8·0	4·28	9	1·15	3·7	3·0	4·25	4·0	
do. do.	kg.	52·4	46·7	46·7	369	406	194	458	1,168	3,759	3,048	4,318	203	
Weight of Projectile	lbs.	3·25	2·0	6·0	18·5	35·2	18·5	35		100	200	290	18·5	21·0
do. do.	kg.	1·49	0·91	2·72	8·39	16	8·39	15·88	45·36	45·36	90·72	131·5	8·39	9·53
Muzzle Velocity	f.s.	1,550	2,000	700	1,820	1,850	1,100	1,100	1,250	2,375	1,500	1,500	1,040	960
do. do.	m.s.	473	609·6	213·4	555	412	335	335·3	381	724	457	457	317	290
Muzzle Energy	f.t.	54	55	20·4	425	444	155	293·6	1,083	3,911	3,120	4,524	138	134
do. do.	m.t.	16·7	17	6·3	181	138	48	90·9	335	1,211	956	1,401	42·7	41·5
		S.A.	S.A.	S.A.										

In same carriage.

In same carriage.

FRENCH NAVAL ORDNANCE.

Date and Pattern of Gun.	Model 1902–06.	Model 1906.	Model 1906–10.	Model 1910.	Model 1912.	Model 1919.	Model 1920.	Model 1923.	Model 1924.	Model 1924.	Model 1927.	Model 1930.
Calibre . . . cms.	24	30·5	30·5	13·8	34	13	15·5	13 8	13	20·3	13·8	15·2
Calibre . . ins.	9·45	12·01	12·01	5·43	13·4	5·12	6·1	5·43	5·12	7·99	5·43	6
Length . . . cals.	49·5	45	44·67	55	45	40	50	40	40	50	40	55
Total weight . tons	28·8	53·23	53·16	5·22	65·23	4·32	8·73	4·05	3·81	20·39	4·61	7·84
Firing Charge, A.P. Projectile . . lbs.	147·05	287·7	277·8	23 68	334	17·05	43·21	17·86	17·05	103·12	17·86	17·30 kilogs.
A.P. Projectile . lbs.	487·22	970·32	952·38	80·47	1222·44	70·44	124·07	87·98	70·44	271·61	87·98	54·17 kilogs.
Muzzle Velocity . f.-s.	2,625	2,559	2,569	2,723	2,605	2,408	2,789	2,297	2,408	2,789	2,297	870 métres seconde

GERMAN NAVAL ORDNANCE.

Calibre.	Usual Naval Designation.	Length in Cals.	Date of Model.	Weight of Gun.	Weight of A.P. Shot.	Initial Velocity.	Maximum penetration direct impact against K.C. at			Danger space against average ships at			Approximate Muzzle Energy.
							9,000 yards.	6,000 yards.	3,000 yards.	10,000	5,000	3,000	
inch	c/m			tons	lbs.	foot-secs.	inches	inches	inches	yards	yards	yards	foot-tons
11	28	..	'28	..	670	..	..	..	..	..	..	..	..
11	28	40	'01	32·2	661·4	2756	6	10	14	150	450	740	31,600
6·7	17	40	'01	7·5	154·5	2756	..	3	5	80	240	460	8,275
5·9	15	50	..	5·5	101·4	3084	..	..	..	..	..	..	6,690
5·9	15	45	'09	5		2920	..	..	5	..	200	420	5,990
4·1	10·5	45	'16	..	38·2	..	..	..	..	..	..	..	..

Brass cartridge cases to all guns.

Lesser guns : 3·4 inch (88 m/m) firing 22 lb. projectiles in modern and 15 lb. in old models.
A.A. guns : 6 inch, 4·1 inch, 3·4 inch War Marks on H.A. mounts (" Flak ").
Projectiles : Guns of 11 inch and over fire A.P., Ersatz A.P., H.E., and common shell.

The 1899 and later models have the recoil utilized to return the gun to firing position for pieces over 6 inch. In 6 in., springs are employed. German guns have a lower muzzle pressure than normally obtains.

11 inch, 40 cal., M. '01 in Deutschland and Braunschweig classes.

ITALIAN NAVAL ORDNANCE.

Corrected to November, 1933.

Official Designation :— Calibre mm., length cal.	305/46	254/45	254/45	203/53	203/50	190/45	152/53	152/50	152/45	120/50	120/50	120/45	102/45	100/47	102/35	76/50	76/45	76/40	76/17
Mark A. = Armstrong, V = Vickers, An. = Ansaldo. S. = Schneider.	A., V.	A.	V.	An.	S.-An.	A., V.	An.	A.	S.	An. 1926	A., V.	A. 1918	S. A.		S.	A., V.	S.	A.	S.
Mark O.T.O. = Odero-Term-Orlando							O.T.O.			O.T.O.		O.T.O.		O.T.O.					
Date of introduction.	1909	1907	1906	1929	1924	1906	1927–29	1918	1911	1931	1909	1928–1931	1917	1929	1914–1915	1909	1911	1916	1912
Designation by calibre, cm.	30·479	25·4	25·4	20·3	20·3	19·05	15·24	15·24	15·24	12·0	12·0	12·0	10·2	10·0	10·2	7·62	7·62	7·62	7·62
Calibre in inches . . .	12	10	10	8	8	7·5	6	6	6	4·75	4·75	4·75	4	3·9	4	3	3	3	3
Lengths: Total, in feet	47·77	39·07	38·715	36·646	34·593	29·22	27·83	25·94	23·42	19·57	20·38	18·38	15·715	15·721	12·247	13·271	11·722	10·292	4·593
Lengths: Rifled Bore, in inches .	477·9	358·4	370·5	358·66	—	281·7	—	256·6	219·2	—	204·64	174·64	150·74	12·365	114·29	126	107·2	101·57	44·8
Lengths: Powder Chamber in inches	97·7	74·91	74·91	64·56	—	51·65	—	44·6	44·6	—	28·64	35·03	27·16	3·112	23·50	22	25·4	—	—
Lengths: Bore in calibres . . .	37·3	35·84	37·05	—	—	37·5	—	42·77	36·54	—	43·31	36·96	37·53	15·371	28·46	42	35·73	28·42	14·96
No. of Grooves	72	60	70	52	52	44	44	36	56	36	36	36	40	26	32	28	25–8	16	24
Twist of Rifling, in calibres	30	30	00–30	—	30	00–30	30	33	36	30	30	30	—	30	—	30	35·9	33	22
Total Weight in tons . .	62·99	34·49	35·339	19·170	20·800	14·478	7·700	8·100	7·025	3·00	3·662	4·035	2·327	2·020	1·200	1·122	0·698	0·660	0·104
Firing Charge: Armour-piercing projectile . . . lb.	346	185	185	111·994	103·19	70·987	43	—	—	—	—	—	—	—	—	—	—	—	—
Firing Charge: Common Shell, H.E., lb.	279·9	185	185	—	—	70·987	—	32·79	30·64	—	14·66	9·589	9·479	10·319	6·50	3·02	3·571	2·281	0·529
Weight: Armour-piercing projectile . . . . . . lb.	997·2	494	494	275·573	260	200·39	103·5	—	—	50·5	—	—	—	—	—	—	—	—	—
Weight: Shell, H.E., lb. . . .	884·4	489·8	489·8	—	—	498·5	—	110·22	103·61	—	48·74	48·74	30·31	30·318	30·31	14·05	14·05	13·954	11·68
Weight: Shrapnel, . . . lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11·68
Bursting Charge: Armour-piercing projectile . . . lb.	16·63	4·37	4·37	—	—	2·332	—	—	—	—	—	—	—	—	—	—	—	—	—
Bursting Charge: Shell, H.E. . . . lb.	53·13	29·86	29·86	—	—	11·706	--	5·996	7·528	—	2·711	2·711	2·866	—	2·866	1·102	1·102	—	0·782
Bursting Charge: Shrapnel, . . . lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·165
Muzzle Velocity in ft. secs. .	2755·9	2788·77	2788·77	3051·180	2743·20	2788·77	2786	2854	2723	2786	2788	2460	2788	2438·40	2460	2460	2460	2214	1230
Muzzle Energy: Total tons per sq. inch	18·63	17·71	17·71	—	—	17·98	—	18·37	16·86	—	18·37	15 75	18·37	—	18·37	18·37	15·75	—	12·47

305/46 A.V., "Duilio and Cesare" class; 254/45 A., "S. Giorgio" class; 254/45 V., "Pisa"; 203/53 An., 1929, "Zara" class; 203/50 S.An. "Trento" class; 190/45 A.V., "S. Giorgio and Pisa" class; 152/53 An., O.T.O., "Colleoni" class; 152/45 S. "Duilio" class; 120/50 An., "Vivaldi" class; 120/50 A.V., "Quarto" and "Cesare"; 120/45 A., "Leone"; 100/47 O.T.O. "Trento, Zara and Colleoni" class.

JAPANESE NAVAL ORDNANCE

Date and Pattern of Gun.	KM. (1)	V. (2)	A. (3)	V. (4)	A. (5)	A. (6)	V. (7)	— (8)	A. (9)	Carried by
Desig. by Calibre, in cms.	40·6	35·6	20·3	15·2	15 2	15·2	15 2	14	12	(1) Mutsu Class.
Calibre, in inches	16	14	8	6	6	6	6	5·5	4·7	(2) Ise Class. Fuso Class. Kongo Class.
Total length, in feet	..	..	..	..	..	..	..	..	..	
Length of Bore, in ins.	..	..	..	..	..	..	..	..	..	(4) Kongo.
Length of Bore, in cals.	45	45	45	50	50	45	45	50	45	(5) Fuso Class. Kongo Class (except Kongo). Yahagi.
Total weight, in tons.	..	83	17·3	8	8 7	8·5	7·5	6 25	3·3	
Weight of Firing Charge, Armour-piercing Projectile lb.	..	..	..	..	..	..	..	..	..	(8) Ise Class. Mutsu Class. Kuma Class. Tenryu Class.
Weight { Armour-piercing Projectile lb.	2190	1400	250	100	100	100	100	82	45	
Weight { Common Shell ”	..	..	..	..	..	..	..	..	..	(9) Yodo.
Muzzle Velocity, in f.-s., A.P. Projectile	2780	2526	2740	3000	3000	2130	3000	2725	2988	
Muzzle Energy in foot-tons	118,000	62,500	13,100	6300	6300	3165	6300	4250	2810	
Perforation at Muzzle,† wrought iron, inches	65	48·2	30·5	25·5	25·5	18·3	25·5	20·8	19·2	
Perforation Krupp Steel, 3000 yds.	13·8 at 10,970 metres	..	10½	6½	6½	4½	6½	..	2½	

† By Tressider's Formula.

A. B. BOFORS—GUNS AND MOUNTINGS

Tables corrected by the Manufacturers, January, 1936.

NAVAL GUNS AND MOUNTINGS.

		25 mm.	25 mm. double.	40 mm.	40 mm.	40 mm. double	75 mm.	75 mm.	75 mm. double	88 mm.	102 mm.	105 mm.	105 mm. double
System		Auto.	Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	mm.	25	25	40	40	40	75	75	75	88	102	105	105
Length of Barrel	cal.	64	64	43	60	60	40	49	60	45	50	40	50
Weight of Gun	kg.	75	75	165	220	220	430	615	1,195	1,665	2,430	1,180	2,550
,, Projectile	kg.	0·250	0·250	0·955	0·955	0·955	6·5	6·5	6·5	10	14	16	16
Muzzle Velocity	m.s.	850	850	700	900	900	600	750	850	800	850	700	800
Range, max.	m.	5,500	5,500	7,800	8,500	8,500	11,800	14,300	16,000	16,000	18,300	14,600	18,200
Rounds per Minute		180	360	120	120	240	30	28	50	20	15	14	25
Weight of Gun, Mounting, and Shield	kg.	570	900	850	1,850	3,500	1,410	1,775	8,300	3,550	7,590	2,950	22,100
Weight of Shield	kg.	—	—	—	—	—	240	—	—	—	—	—	4,500
Angle of Elevation	deg.	90	90	90	90	90	40	80	90	40	80	32	85
,, Depression	deg.	10	10	10	10	10	10	5	10	10	10	10	10

NAVAL GUNS AND MOUNTINGS—*continued.*

		12 cm.	12 cm.	12 cm. double	15 cm.	15 cm.	15 cm. double	20·3 cm. double	25·4 cm. double	28 cm. double
Diameter of Bore	mm.	120	120	120	149·1	149·1	149·1	203	254	283
Length of Barrel	cal.	45	50	50	45	50	50	50	45	45
Weight of Gun	kg.	2,600	4,100	4,100	6,100	7,865	7,500	22,500	37,900	44,100
,, Projectile	kg.	21	24	24	46	46	46	115	225	305
Muzzle Velocity	m.s.	800	900	900	835	900	900	900	850	870
Range, max.	m.	19,300	19,500	19,500	19,600	24,500	24,500	28,000	30,300	25,000
Rounds per Minute		12	10	18	8	7	15	12	8	6
Weight of Gun, Mounting, and Shield	kg.	8,200	10,000	20,000	17,860	28,300	72,000	170,000	320,000	494,000
Weight of Shield	kg.	800	1,500	1,600	4,550	12,000	24,200	29,000	114,000	225,000
Angle of Elevation	deg.	45	30	30	30	60	60	45	45	20
,, Depression	deg.	10	10	10	10	10	10	5	10	5

A.B. Bofors—Guns and Mountings. *Howitzers and Field Guns.*

		75 mm. Field.	75 mm. Field.	10.5 cm. Field Howr.	10·5 cm. Field.	15 cm. Field Howr.	15 cm. Field.	21 cm. Field Howr.
Diameter of Bore	mm.	75	75	105	105	149·1	149·1	216
Length of Barrel	cal.	40	46	22	42	24	43	14
Weight of Gun	kg.	365	400	495	1,200	1,825	4,200	2,780
,, Projectile	kg.	6·5	6·5	14	15·3	41	46	100
Muzzle Velocity	m.s.	625	710	500	785	580	775	475
Range, max.	m.	12,500	14,000	11,000	17,000	15,000	22,000	13,000
Rounds per Minute		25	25	12	10	6	4	3
Weight of Gun, Mounting and Shield	kg.	1,350	1,550	1,650	3,650	5,600	12,000	7,800
Angle of Elevation	deg.	45	45	45	45	45	45	70
,, Depression	deg.	5	5	5	3	5	2	6

		Tank Guns.		Infantry Guns.					Mountain Howitzers.	
				37–81 mm.		47–75 mm.				
		37 mm.	47 mm.	37 mm. Barrel.	81 mm. Barrel.	47 mm. Barrel.	75 mm. Barrel.	37 mm.	75 mm.	105 mm.
Diameter of Bore	mm.	37	47	37	81	47	75	37	75	105
Length of Barrel	cal.	45	33	45	20	33	20	45	22	12
Weight of Gun	kg.	105	105	144		130		103	256	290
,, Projectile	kg.	0·7	1·5	0·7	4·4	1·5	4·5	0·7	6·5	12
Muzzle Velocity	m.s.	800	560	800	320	560	300	800	470	300
Range, max.	m.	6,400	5,400	7,100	6,000	6,500	5,400	6,400	10,000	6,600
Rounds per Minute		30	30	25	20	25	20	30	25	12
Weight of Gun, Mounting and Shield	kg.	300	300	450		425		335	790	840
Angle of Elevation	deg.	25	25	80		60		25	50	40
,, Depression	deg.	10	10	8		5		10	10	10

A.B. BOFORS—GUNS AND MOUNTINGS. *Anti-Aircraft Guns.*

		25 mm. Fixed.	25 mm. Mobile.	40 mm. Fixed.	40 mm. Mobile.	75 mm. Mobile.	75 mm. Mobile.	75 mm. Fixed.	80 mm. Mobile.	102 mm. Fixed.	105 mm. Mobile.
System		Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . .	mm.	25	25	40	40	75	75	75	80	102	105
Length of Barrel . . .	cal.	64	64	60	60	50	52	60	50	50	44
Weight of Projectile . .	kg.	0·250	0·250	0·955	0·955	6·5	6·5	6·5	8	14	16
Muzzle Velocity	m.s.	850	900	900	900	750	840	850	750	850	750
Rounds per Minute		180	180	120	120	30	25	25	25	15	12
Weight of Gun and Mounting	kg.	500	1,020	1,550	1,700	2,600	4,000	3,400	3,000	7,000	6,200
Angle of Elevation . . .	deg.	90	90	90	90	85	85	85	85	85	85
,, Depression. . .	deg.	10	5	10	5	3	5	5	3	5	5

NETHERLANDS NAVAL ORDNANCE.

Pattern of Gun :—K. = Krupp ; B. = A. B. Bofors ; V. = Vickers ; H.I.H. = Holl. Ind. Handel Mij.

	K.	K.	K.	B.	H.I.H.	B.	B.	H.I.H.	K.	B.	H.I.H.	B.	H.I.H.	K.	K.	K.	V.	B.
						15 cm. double											2 pdr.	2 pdr. double
Diameter of Bore mm.	280	240	150	150	150	150	120	120	105	88	88	75	75	75	50	50	40	40
Length of Barrel cal.	40	40	50	50	50	50	50	50	50	45	45	55	55	55	40	55	40	60
Weight of Gun kg.	31,000	24,500	7,240	7,250	7,420	7,500	4,060	4,265	2,475	1,475	1,665	1,385	1,665	1,470	245	365	280	320
Weight of Projectile kg.	270	172·85	46	46	46·25	46·25	24	24	18	10	10	5·90	5·90	5·90	1·75	1·76	0·906	0·955
Muzzle Velocity m/sec.	890	814	900	900	900	900	900	900	883	800	800	895	895	895	680	895	600	900
Range max. . . m.	16,100	17,200	22,000	22,000	22,000	22,000	16,000	16,000	12,000	11,400	11,400	10,500	10,500	10,500	6,000	6,000	5,000	8,500
Rounds per Minute .	3	4	10	10	10	20	15	15	15	20	20	28	28	28	25	30	230	240
Weight of Gun, Mounting and Shield kg.	197,424	125,700	19,525	20,500	20,790	72,000	8,610	9,770	8,245	4,603	3,411	4,700	4,700	4,695	1,128	948	910	3,500
Weight of Shield kg.	—	—	5,270	6,100	6,400	24,200	310	310	2,770	—	—	—	—	—	—	—	—	—
Angle of Elevation degr.	15	20	25	29	30	60	30	35	20	70	35	95	90	80	20	15	85	90
Angle of Depression degr.	4	4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

BETHLEHEM STEEL CO.

SHIP AND COAST-DEFENCE GUNS.

Calibre.		Length of bore.	Weight of gun, including breech mechanism.		Weight of projectile.		At Muzzle.						Type of Ammunition.
							Velocity.		Energy.		Penetration of steel-plate (De Marre).		
inches.	millimetres.	calibres.	lbs.	kgs.	lbs.	kgs.	ft. per sec.	metres per sec.	foot-tons.	metre-tons.	inches.	milli-metres.	
1·457	37	about {50	160	72·5	1·07	0·48	2,150	655	34	10·5	2·04	51·8	Fixed in cartridge case.
1·850	47	about {50	550	249·5	3·3	1·5	2,400	732	132	41	4·11	104·4	,, ,,
2 244	57	50	960	435·5	6·07	2·75	2,400	732	243	75	5·17	131·3	,, ,,
3	76	50	1950	884·5	13	5·9	2,700	823	658	204	7·71	195·8	,, ,,
			tons.										
4	102	50	2·6	2,642	33	15	2,800	853	1,795	557	11·61	294·9	,, ,,
4	102	50	2·6	2,642	30·86	14	3,000	914	1,928	597	12·22	310·4	,, ,,
5	127	51	5·0	5,080	50	22·7	3,150	960	3,440	1,067	14·56	369·8	Separate, with powder in bag.
6	152	45	7·0	7,112	105	47·6	2,600	792	4,926	1,523	15·47	392·9	Separate, with cartridge case.
6	152	50	8·4	8,534	105	47·6	2,800	853	5,713	1,767	17·19	436·6	Separate, with powder in bag.
6	152	53	10·1	10,260	105	47·6	3,000	914	6,559	2,028	18·97	481·8	,, ,, ,,
7	178	45	12·7	12,900	165	74·8	2,700	823	8,348	2,584	19·11	485·4	,, ,, ,,
7	178	50	14·5	14,730	165	74·8	2,900	884	9,631	2,982	21·16	537·5	,, ,, ,,
8	203	45	18·6	18,900	260	118	2,800	853	14,148	4,379	24·15	613·4	,, ,, ,,
8	203	50	22·3	22,660	260	118	2,900	884	15,177	4,703	25·38	644·6	,, ,, ,,
9·2	234	50	30·4	30,890	380	172	2,900	884	22,181	6,856	28·66	727·9	,, ,, ,,
10	254	45	35·4	35,970	515	234	2,800	853	28,023	8,685	30·97	786·6	,, ,, ,,
10	254	50	43·9	44,600	515	234	2,900	884	30,061	9,327	32·56	827·0	,, ,, ,,
12	305	45	53·8	54,660	870	395	2,800	853	47,341	14,660	37·05	941·1	,, ,, ,,
12	305	50	57·5	58,400	870	395	2,900	884	50,783	15,745	38·95	989·3	,, ,, ,,
14	356	45	64·6	65,650	1,400	635	2,600	792	65,687	20,317	39·69	1008·0	,, ,, ,,
14	356	50	79·4	80,700	1,400	635	2,800	853	76,181	23,567	44·12	1121	,, ,, ,,
15	381	45	86·5	87,880	1,700	771	2,600	792	79,763	24,668	42·35	1076	,, ,, ,,
16	406	45	105·0	106,500	2,100	953	2,600	792	98,530	30,491	45·95	1167	,, ,, ,,
16	406	50	128·0	130,200	2,100	953	2,800	853	114,272	35,369	51·08	1297	,, ,, ,,
16	406	50	140·0	142,400	2,330	1,057	2,700	823	117,900	36,500	52·39	1331	,, ,, ,,
18	457	45	150·0	152,400	3,330	1,510	2,450	747	138.734	42,979	51·71	1313	,, ,, ,,

Guns of 4·7-in. calibre and under, equipped with the wedge-type breech mechanism, are supplied with an automatic breech-opening device, if desired.

UNITED STATES NAVAL ORDNANCE.

GUN.	MARK.	Length in Calibres.	Total Length.	Capacity of Chamber in Cubic Inches.	Travel of Projectile in Inches.	Weight of Gun.	Weight of Projectile.	Weight of Charge.	Muzzle Velocity.	Muzzle Energy.	Penetration at Muzzle, Krupp Armour, using Capped-Projectile.
			inch.			tons.	lb.	lb.	ft.-seconds.	ft.-tons.	inch.
3-in. S.A. . . .	V., VI. . .	50	159	219	128·3	1·0	13	3·85	2700	658	3·3
4-in. R.F.G. . . .	III., IV., V., VI. .	40	164	331	134·5	1·5	33	4·85	2000	915	3·4
4-in. R.F.G. . . .	VII. . . .	50	205	652	168·3	2·6	33	9·0	2500	1,430	4·6
4-in. R.F.G. . . .	VIII.‡ . . .	50	205	652	168·3	2·9	33	12·3	2800	1,794	5·3
5-in. R.F.G. . . .	II., III., IV. . .	40	206	656	167·8	3·1	50	10·0	2300	1,845	5·3
5-in. B.L.R. . . .	V., VI. . . .	50	256	1,200	215·6	4·6	60	19·2	2700	3,032	6·2
5-in. B.L.R. . . .	VI. . . .	50	256	1,200	215·6	4·6	50	20·5	3000	3,122	6·4
5-in. R.F.G. . . .	VII.† . . .	51	261	1,135	215·6	5·0	50	23·8	3150	3,439	6·8
6-in. R.F.G. . . .	II., III. . . .	30	196	1,318	145·4	4·8	105	18·8	1950	2,768	5·3
6-in. R.F.G. . . .	IV., VII. . .	40	256	1,320	205·8	6·0	105	18·8	2150	3,365	6·0
6-in. R.F.G. . . .	IX. . . .	45	270	1,320	221·7	7·0	105	18·8	2250	3,685	6·3
6-in. B.L.R. . . .	VI. . . .	50	300	2,101	247·5	8·3	105	30·0	2600	4,920	8·0
6-in. B.L.R. . . .	VIII. . . .	50	300	2,101	247·5	8·6	105	37·0	2800	5,707	8·3
7-in. B.L.R. . . .	II.	45	323	3,643	259·8	12·7	165	58·0	2700	8,338	9·6
8-in. B.L.R. . . .	III., IV. . . .	35	305	3,170	245·8	13·1	260	43·8	2100	7,948	8·6
8-in. B.L.R. . . .	V.	40	343	5,243	273·1	18·1	260	78·0	2500	11,264	10·6
8-in. B.L.R. . . .	VI. . . .	45	369	5,243	299·1	18·7	260	98·5	2750	13,360	12·0
10-in. B.L.R. . . .	I., II. . . .	30	329	6,779	251·1	25·1	510	90·0	2000	14,141	10·7
10-in. B.L.R. . . .	III. . . .	40	413	10,222	327·0	34·6	510	207·5	2700	25,772	15·6
12-in. B.L.R. . . .	I., II. . . .	35	441	11,991	345·2	45·3	870	160·0	2100	26,596	14·2
12-in. B.L.R. . . .	III., IV. . . .	40	493	17,096	392·2	52·1	870	237·5	2400	34,738	16·8
12-in. B.L.R. . . .	III., IV. . . .	40	493	17,096	392·2	52·1	870	305·0	2600	40,768	18·5
12-in. B.L.R. . . .	V.	45	553	16,974	452·0	52·9	870	305·0	2700	43,964	19·4
12-in. B.L.R. . . .	VI. . . .	45	553	14,970	452·0	53·6	870	340·0	2850	48,984	20·8
12-in. B.L.R. . . .	VII. . . .	50	607	14,296	506·3	56·1	870	340·0	2950	52,483	21·7
13-in. B.L.R. . . .	I., II. . . .	35	479	15,068	374·9	61·4	1130	180·0	2000	31,333	15·0
14-in. B.L.R. . . .	I.	45	642	..	..	63·6	1400	365·0	2600	65,606	39·7*
14-in. B.L.R. . . .	II.	50	700	..	..	82·2	1400	..	2800	76,180	44·1
16-in. B.L.R. . . .	..	45	..	..	..	105·0	2100		2006	98,500	45·95
16-in. B.L.R. . . .	..	50	..	..	..	130·0	2100		2800	114,270	51·08

* De Marre formula.

† All battleships from the Delaware class onward have this gun for torpedo defence.

‡ There is now a 4-in. 50-cal. anti-aircraft gun.

The U.S. Navy has a 5-in. 25-calibre A.A. gun; a 6-in. 53-calibre gun; and an 8-in. 55-calibre gun, but complete details are not yet published.

MISCELLANEOUS

THE GERMAN NAVAL AGREEMENT.

A naval agreement between the British and German Governments was announced in an exchange of Notes issued on June 18, 1935, in the form of a White Paper (Cmd. 4930, price 1d.). The document is entitled " Exchange of Notes between His Majesty's Government in the United Kingdom and the German Government regarding the Limitation of Naval Armaments." The following is the full text of the Notes :—

NO. 1.

Sir Samuel Hoare to Herr von Ribbentrop.

Foreign Office, June 18, 1935.

YOUR EXCELLENCY,

During the last few days the representatives of the German Government and His Majesty's Government in the United Kingdom have been engaged in conversations, the primary purpose of which has been to prepare the way for the holding of a general conference on the subject of the limitation of naval armaments. I have now much pleasure in notifying your Excellency of the formal acceptance by His Majesty's Government in the United Kingdom of the proposal of the German Government discussed at those conversations that the future strength of the German navy in relation to the aggregate naval strength of the Members of the British Commonwealth of Nations should be in the proportion of 35 : 100. His Majesty's Government in the United Kingdom regard this proposal as a contribution of the greatest importance to the cause of future naval limitation. They further believe that the agreement which they have now reached with the German Government, and which they regard as a permanent and definite agreement as from to-day between the two Governments, will facilitate the conclusion of a general agreement on the subject of naval limitation between all the naval Powers of the world.

2. His Majesty's Government in the United Kingdom also agree with the explanations which were furnished by the German representatives in the course of the recent discussions in London as to the method of application of this principle. These explanations may be summarised as follows :—

(*a*) The ratio of 35 : 100 is to be a permanent relationship, *i.e.* the total tonnage of the German fleet shall never exceed a percentage of 35 of the aggregate tonnage of the naval forces, as defined by treaty, of the Members of the British Commonwealth of Nations, or, if there should in future be no treaty limitations of this tonnage, a percentage of 35 of the aggregate of the actual tonnages of the Members of the British Commonwealth of Nations.

(*b*) If any future general treaty of naval limitation should not adopt the method of limitation by agreed ratios between the fleets of different Powers, the German Government will not insist on the incorporation of the ratio mentioned in the preceding sub-paragraph in such future general treaty, provided that the method therein adopted for the future limitation of naval armaments is such as to give Germany full guarantees that this ratio can be maintained.

(*c*) Germany will adhere to the ratio 35 : 100 in all circumstances, *e.g.*, the ratio will not be affected by the construction of other Powers. If the general equilibrium of naval armaments, as normally maintained in the past, should be violently upset by any abnormal and exceptional construction by other Powers, the German Government reserve the right to invite His Majesty's Government in the United Kingdom to examine the new situation thus created.

(*d*) The German Government favour, in the matter of limitation of naval armaments, that system which divides naval vessels into categories, fixing the maximum tonnage and/or armament for vessels in each category, and allocates the tonnage to be allowed to each Power by categories of vessels. Consequently, in principle, and subject to (*f*) below, the German Government are prepared to apply the 35 per cent. ratio to the tonnage of each category of vessel to be maintained, and to make any variation of this ratio in a particular category or categories dependent on the arrangements to this end that may be arrived at in a future general treaty on naval limitation, such arrangements being based on the principle that any increase in one category would be compensated for by a corresponding reduction in others. If no general treaty on naval limitation should be concluded, or if the future general treaty should not contain provision creating limitation by categories, the manner and degree in which the German Government will have the right to vary the 35 per cent. ratio in one or more categories will be a matter for settlement by agreement between the German Government and His Majesty's Government in the United Kingdom, in the light of the naval situation then existing.

(*e*) If, and for so long as, other important naval Powers retain a single category for cruisers and destroyers, Germany shall enjoy the right to have a single category for these two classes of vessels, although she would prefer to see these classes in two categories.

(*f*) In the matter of submarines, however, Germany, while not exceeding the ratio of 35 : 100 in respect of total tonnage, shall have the right to possess a submarine tonnage equal to the total submarine tonnage possessed by the Members of the British Commonwealth of Nations. The German Government, however, undertake that, except in the circumstances indicated in the immediately following sentence, Germany's submarine tonnage shall not exceed 45 per cent. of the total of that possessed by the Members of the British Commonwealth of Nations. The German Government reserve the right in the event of a situation arising which in their opinion makes it necessary for Germany to avail herself of her right to a percentage of submarine tonnage exceeding the 45 per cent. above mentioned, to give notice to this effect to His Majesty's Government in the United Kingdom, and agree that the matter shall be the subject of friendly discussion before the German Government exercise that right.

(*g*) Since it is highly improbable that the calculation of the 35 per cent. ratio should give for each category of vessels tonnage figures exactly divisible by the maximum individual tonnage permitted for ships in that category, it may be necessary that adjustments should be made in order that Germany shall not be debarred from utilising her tonnage to the full. It has consequently been agreed that the German Government and His Majesty's Government in the United Kingdom will settle by common accord what adjustments are necessary for this purpose, and it is understood that this procedure shall not result in any substantial or permanent departure from the ratio 35 : 100 in respect of total strengths.

3. With reference to sub-paragraph (*c*) of the explanations set out above, I have the honour to inform you that His Majesty's Government in the United Kingdom have taken note of the reservation and recognise the right therein set out, on the understanding that the 35 : 100 ratio will be maintained in default of agreement to the contrary between the two Governments.

4. I have the honour to request your Excellency to inform me that the German Government agree that the proposal of the German Government has been correctly set out in the preceding paragraphs of this note.

I have the honour to be, etc.
SAMUEL HOARE.

NO. 2.

Herr von Ribbentrop to Sir Samuel Hoare.
(Translation.)

London, June 18, 1935.

YOUR EXCELLENCY,

I have the honour to acknowledge the receipt of your Excellency's note of to-day's date, in which you were so good as to communicate to me on behalf of His Majesty's Government in the United Kingdom the following :—

(Here follows a German translation of paragraphs 1 to 3 of No. 1.)

I have the honour to confirm to your Excellency that the proposal of the German Government is correctly set forth in the foregoing note, and I note with pleasure that His Majesty's Government in the United Kingdom accept this proposal.

The German Government, for their part, are also of the opinion that the agreement at which they have now arrived with His Majesty's Government in the United Kingdom, and which they regard as a permanent and definite agreement with effect from to-day between the two Governments, will facilitate the conclusion of a general agreement on this question between all the naval Powers of the world.

I have the honour to be, etc.
JOACHIM VON RIBBENTROP,
Ambassador Extraordinary and
Plenipotentiary of Germany.

THE WHITE PAPER.

STATEMENT RELATING TO DEFENCE.

Presented by the Prime Minister to Parliament by Command of His Majesty, 3rd March, 1936.

I.

IN March of last year, His Majesty's Government in the United Kingdom acceded to a suggestion which had often been made that consideration by the House of Commons of the estimates for the Defence Services should be preceded by a Debate on Imperial Defence as a whole. Before the Debate, a White Paper, dated the 1st March, 1935, was issued in order to indicate generally the policy of the Government on Imperial Defence, and the conditions which necessitated their proposals (Cmd. 4827). This year it is proposed to follow the same procedure. Indeed, developments which have taken place in the world during the intervening twelve months make it more than ever necessary that the House of Commons, before discussing details of estimates, should make a comprehensive survey of the general problems of defence and should have placed before it the reason and the justification for the scheme of increased expenditure which it will be asked to authorise.

2. The previous White Paper began by pointing out what is the relation between diplomatic and political action on the one hand, and expenditure on the Navy, Army, and Air Force on the other. It said : " The establishment of peace on a permanent footing is the principal aim of British foreign policy. The first and strongest defence of the peoples, territories, cities, overseas trade and communications of the British Empire is provided by the maintenance of peace. If war can be banished from the world, these vast and world-wide interests will remain free from the dangers of attack, and the great work of civilisation and trade will proceed unhampered by the fears that have hindered their progress from the earliest recorded times until to-day. That is why every British Government is bound to use its utmost endeavours to maintain peace."

The White Paper went on to describe the chief methods which British policy is pursuing to secure the establishment of peace on a permanent footing, and amongst them laid emphasis on unswerving support of the League of Nations, on the promotion of collective security, and on repeated efforts and initiatives to promote better international understanding, and to reach international agreement for the reduction and limitation of armaments. These objects and purposes continue to inspire British policy, and the programme of defence expenditure which the country now has to face does not imply any reversal or qualification of them, but is on the contrary the indispensable condition of their attainment.

3. In recent years successive Governments have deliberately taken the course of postponing defence expenditure which would certainly have been justified and might indeed have been regarded

as necessary, in order to give the best possible opportunity for the development of a new international order in which such expenditure might be avoided. Our action was thus described in paragraphs 6 and 7 of the White Paper of a year ago.

> " 6. During the years that all parties in this country have been seeking to carry out the policy outlined above, there has been a steady decline in the effective strength of our armaments by sea and land. In the air we virtually disarmed ourselves in 1919, and, subsequently, from time to time postponed attainment of the minimum air strength regarded as necessary to our security in the face of air developments on the Continent. It is not that British Governments have neglected to keep themselves informed of the position. Every year the state of our armaments has been anxiously considered, and if risks have been run they have been accepted deliberately in pursuit of the aim of permanent peace. Again and again, rather than run any risk of jeopardising some promising movement in this direction by increasing expenditure on armaments, Governments have postponed the adoption of measures that were required when considered from the point of view of national defence alone. In this way we have taken risks for peace, but, as intimated by the Secretary of State for Foreign Affairs in the debate on the Address on the 28th November, 1934, ' disarming ourselves in advance, by ourselves, by way of an example, has not increased our negotiating power in the Disarmament discussions at Geneva.' "
>
> " 7. Parliament and people, however, have been warned again and again that serious deficiencies were accumulating in all the Defence Services, and that our desire to lead the world towards disarmament by our example of unilateral disarmament has not succeeded. We have not contributed thereby to general disarmament, and are approaching a point when we are not possessed of the necessary means of defending ourselves against an aggressor."

4. These considerations have gained in force during the past year. Conditions in the international field have deteriorated. Taking " risks for peace " has not removed the dangers of war. We have really no alternative in the present state of the world but to review our defences and to provide the necessary means both of safeguarding ourselves against aggression and of playing our part in the enforcement by common action of international obligations. The Government have therefore made a prolonged and exhaustive examination of the present state of the Navy, Army, and Air Force, and the proposals they now make represent nothing more than what is found to be essential in present circumstances.

5. It should be emphasised that in questions of defence our situation is different from that of most other great nations. Their forces can without risk be concentrated in limited areas near their own shores. Our world-wide responsibilities render this impossible. The history of the Italo-Abyssinian dispute, and of our own action in regard to it, illustrates how claims upon our defensive strength

may arise at short notice in various parts of the world. These claims can only be discharged if we have made adequate provision to meet them, and the scale upon which such provision is to be made must be considered in relation to the continued increase in the armaments of many foreign countries.

6. The development of the dispute between Italy and Abyssinia was regarded from the first with grave anxiety by the League of Nations, which made repeated attempts to avert it. As a Member of the League, no less than as a friend to both parties to the dispute, we were closely concerned. As early as February, 1935, we warned the Italian Government of our anxiety at the course that Government appeared to be following, and the warning was repeated at frequent intervals throughout the summer of 1935. In conjunction with the other Members of the League we spared no effort to prevent a final breach.

7. But in the meantime circumstances were developing which compelled this country to take precautionary action in the Mediterranean and Red Sea. The fundamental difference that grew up last summer between the League of Nations and Italy, combined with the possibility of League action, led during July and August last to a campaign of violent and menacing propaganda in Italy largely directed against the United Kingdom as one of the foremost upholders of the Covenant. A point was reached in August last when we could no longer disregard the possibility of an incident occurring which might precipitate an extension of the conflict.

8. His Majesty's Government felt that the best way to secure that no such incident should arise was to guard promptly against it, more particularly in view of the extent to which the Italian garrison in Libya was being reinforced. After considering the recommendations of the Chiefs of Staff Sub-Committee on the military aspects of the situation, the Government decided to strengthen and redispose our naval forces and to increase the defences, garrisons, and air forces at Gibraltar, Malta, and Aden as well as in Egypt. From the 22nd August onwards the situation was watched from day to day by one of the standing Sub-Committees of the Committee of Imperial Defence,* under the Chairmanship of the Prime Minister, and this Sub-Committee reported direct to the Cabinet.

The most careful review of these dispositions and arrangements shows that they were justified and indeed necessitated by the emergency with which His Majesty's Government had to deal.

9. Although in the circumstances created by the Italo-Abyssinian conflict, His Majesty's Government were able to make the dispositions which the situation required, they were embarrassed by the decline in the effective strength of their armaments by sea, land, and air, and the accumulation of deficiencies in all the Defence Services, to which allusion was made in the White Paper of 1935 (Cmd. 4827). It was only possible to safeguard the position in the Mediterranean and the Red Sea by denuding other areas to an extent which might have involved grave risks.

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* Entitled the Sub-Committee on Defence Policy and Requirements.

10. Even more important than the circumstances of any particular dispute is the bearing on our own defensive arrangements of the rising level of national armaments elsewhere. It is true that an increase in the armed strength of other nations who will co-operate for collective security may increase the power of the League. But an increase of armed strength may also prove an added power in the hands of a possible aggressor. In any event, collective security can hardly be maintained unless every member of the League of Nations is prepared to make a contribution, adequate in relation to its resources, to the strength of the whole. We cannot excuse our own weakness by pointing to the strength of our neighbours. Our weakness would prevent us from playing our due part in enforcing collective security, whereas our ability to make our proper contribution may well be decisive in deterring a potential aggressor from facing the risk of breaking world peace. It is essential, therefore, that the relation of our own armed forces to those of other Great Powers should be maintained at a figure which will be high enough to enable us to exercise the influence and authority in international affairs which are alike required for the defence of vital British interests, and in the application of the policy of collective security.

11. The fact that the level of national armaments has been rising all over the world is deplorable, but it cannot be denied. A plain statement as to recent increases of armaments in certain other countries is as follows :—

12. German rearmament has been proceeding throughout the year at a steady but rapid rate. As to the fact of the rearmament there is no concealment, and it has been referred to with satisfaction in the statements of German public men ; but regarding the details there is still a great deal of secrecy. In March last conscription on the basis of one-year service was universally re-established ; and the Government announced a peace-time army establishment of 36 Divisions with a strength of 550,000 men. The German Chancellor informed Sir John Simon last March that Germany was aiming at air parity between Great Britain, France, and Germany provided that the development of the Soviet Air Force was not such that revision of these figures would become necessary. What has since occurred indicates a continuous development of the German Air Force. The Naval Agreement reached with the German Government on the 18th June, 1935, is in a different category inasmuch as it limits the expansion of the German Navy to a definite proportion of the strength of British Naval Forces. Nevertheless, the new German Navy, even within this limitation, is an addition to the armaments of the world which cannot be left out of account.

13. In France two-year service was reintroduced in the spring of last year. The French Air Force is in process of an important reorganisation and re-equipment. The barrier fortresses on the north-eastern frontier are being extended at great cost to cover also the northern departments. Special borrowing powers have been obtained to meet specific items of defence expenditure.

14. In Belgium the Army expenditure shows a heavy increase and the fortresses on the eastern frontier are being rapidly strengthened and brought up to date.

15. The Italian Army has been for the past six months on a war footing. In October last it was stated that 1,200,000 men were under arms, and further recruits have been called up since that date. The Italian Air Force is being rapidly and completely re-equipped and is also being enlarged.

16. The Soviet forces, according to the latest official figures given by a Soviet Minister on the 15th January last, have now been increased to a total of 1,300,000 men. A further increase in the Soviet Air Force is already in progress.

17. In Japan the re-equipment of the Army continues to be pressed forward in accordance with a comprehensive programme, and greater sums than ever before are appropriated in the budget for 1936–37 for the naval and military services combined. Already in 1935–36 the Army and Navy accounted for 46 per cent. of the total budgetary expenditure, while the deficit on the budget was £45 million.

18. In the United States the total annual expenditure on defence from revenue and loans combined has risen from £108 million in 1933–34 to £180 million in 1935–36. These figures include no provision for non-effective charges (*e.g.* pensions), which in the case of British estimates for 1935 represented no less than £18 million out of the total of £124 million.

19. His Majesty's Government will continue to do their utmost to improve international relations and to promote agreement for limitation of armaments. The proposals for defence outlined in this Paper do not betoken any abandonment of the international policy hitherto pursued. That policy has been steadily directed to discouraging competition in armaments—the recent Naval Agreement with Germany and the present effort to conclude a new Naval Agreement with the Washington Powers are instances—and it is true that a general raising of levels all round is no guarantee of peace. But, in determining our own defence programme, it is impossible to disregard the extent of the preparations which have been made by others.

II.

20. As was stated in the White Paper of March, 1935, a coordinated plan for the reconditioning and modernisation of our defence forces and defences had already been drawn up. In the case of the Royal Air Force the new programme with further expansions announced to Parliament on the 22nd May last was being carried out with the utmost energy and vigour, but in the case of the Navy and Army the steps actually taken had been directed only to making good the worst deficiencies. The development of the situation in the Italo-Abyssinian dispute, however, rendered necessary the

acceleration of some of the measures contemplated and involved expenditure which has been provided for in the Supplementary Estimates presented on the 17th February. The fresh examination of the position which was made during the summer and autumn led to the conclusion that it was necessary to make further changes in the Royal Air Force, to speed up the measures contemplated for the modernisation of the Navy and Army, to provide as rapidly as possible the necessary reserves of stores, ammunition, and equipment and to organise the industrial resources of the country in such a way as to allow of immediate expansion of productive capacity in case of emergency.

21. In the following paragraphs a brief outline is given of the objectives aimed at; it must, however, be emphasised that in many respects the situation is constantly changing and that it may therefore be necessary to modify the particular measures to be taken from time to time in one direction or the other and the scheme has been framed with this possibility in view.

22. The overwhelming importance of the Navy in preserving our sea communications and thus ensuring to this country the supplies of seaborne food and raw materials on which its existence depends was fully set out in the White Paper of March last. No less important is the responsibility of the Navy, stressed also in the same document, for maintaining free passage between the different parts of the Empire of troops and supplies of all kinds, thus assuring the very foundation of our system of Imperial Defence.

23. To render the Navy capable in all circumstances of fulfilling these requirements it will be necessary not only to proceed with new construction at a more rapid rate than in recent years, but also to make good existing deficiencies in ammunition and stores of all kinds. Until the end of 1936 the strengths of all the principal Naval Powers are regulated by treaty. What will remain of this limitation after the conclusion of the present Naval Conference is not yet certain, but it would seem likely that agreement will not extend beyond advance notification of annual programmes, exchange of information, and certain measures of qualitative limitation on the sizes of ships and their guns.

24. The agreement concluded in June, 1935, with Germany is a stabilising factor which shows clearly the value of quantitative agreements when these can be attained. The failure to arrive at a general agreement, however, does not necessarily imply an intention on the part of other Powers to develop their naval strength in such a way as to upset the balance of security, and the present plans of His Majesty's Government do not take account of any developments of this kind.

25. The London Naval Treaty prohibits the building of new capital ships so long as it remains in force, *i.e.* till the 31st December, 1936, but the process of replacement cannot be delayed beyond that date, and it is intended to make a beginning early in the calendar year 1937, when two new capital ships will be laid down. The modernisation of certain of our existing battleships will be continued.

26. In cruisers the aim is to increase the total number to 70, of which 60 would be under-age and 10 over-age. Five cruisers will be included in the 1936 programme.

27. A steady replacement programme for destroyers and submarines is contemplated, while in the case of sloops and small craft generally, the present rate of construction will be continued.

28. A new aircraft carrier, of a smaller type, will be laid down at an early date. The growing naval importance of the Fleet Air Arm will necessitate a considerable expansion of its present strength. Compared with other Navies, such as those of Japan or the United States of America, the number of first line Fleet Air Arm aircraft is considerably lower than it should be and it is intended to bring it up to substantially higher figures in the course of the next few years. This increase will, of course, necessitate a corresponding increase in personnel.

29. Finally, it will be necessary also to increase the personnel of the Navy to man the new vessels and to make good existing deficiencies. The increase must be a gradual process in order to ensure efficiency, and by the 31st March, 1937, the number is expected to rise by about 6,000 men.

30. The Army has three main functions to perform; it has to maintain garrisons overseas in various parts of the Empire, to provide the military share in Home Defence, including anti-aircraft defence, coast defence, and internal security, and, lastly, in time of emergency or war to provide a properly equipped force ready to proceed overseas wherever it may be wanted. The present peacetime serving strength of the regular military field units in Great Britain is approximately 115,000 men.

31. It must be remembered that this force constitutes the only source from which immediate reinforcements to any part of the Empire can be drawn. Compared with 1914, our Army has been reduced by no less than twenty-one battalions of infantry, although our peace commitments are greater than ever before. Owing to this reduction of infantry we are unable to maintain the balance of home and foreign service battalions, and the result is hardship to the units which are given additional foreign service and injury both to recruiting and to the efficiency of our Army. His Majesty's Government propose to raise four new battalions of infantry, which will to some extent mitigate the present difficulties of the policing duties which our Imperial responsibilities place upon us.

32. It is not intended, in connection with the present proposals, to make any further increase in the number of fighting units in the Regular Army beyond these four battalions. But it is urgently necessary that the Army formations already existing should be organised in the most effective form and equipped with the most modern armament and material, together with adequate reserves of ammunition and stores. Plans have been worked out for this purpose and the necessary steps are being taken to put them into operation. Particular attention is being given to our Field Artillery equipments, which will be thoroughly modernised.

33. The Territorial Army, though generally regarded as the second line in our military forces, actually provides the first line in anti-aircraft and coast defence at home. It is recruited on the basis that it will be ready to serve wherever it may be needed, and if the Regular Army should require support abroad, the Territorial Army will be called upon to give that support, serving not as drafts but in its own units and formations. It therefore holds an important place in our defence organisation, and it is the intention of His Majesty's Government to do all that is possible to encourage its recruiting and increase its efficiency. For the present, owing to the demands upon the capacity of industrial output which must necessarily be made in the first instance by the Regular Army, it is not possible simultaneously to recondition the Territorial Army, but a beginning will be made at once in the task of improving its present inadequate equipment and training.

34. The modernisation of coast defences at defended ports at home and abroad will be proceeded with at an accelerated rate, and the reorganisation of anti-aircraft defences in the South-East of England which has already been authorised will be extended with a view to covering the important industrial districts in the centre and north of the country.

35. The Government also consider it essential to take immediate steps to improve the housing conditions of the Army, which are at present unsatisfactory, and progress in this matter will be made as rapidly as possible during the next few years.

36. The prime function of the Royal Air Force is to provide an effective deterrent to any attack upon the vital interests of this country whether situated at home or overseas. In the present situation this is the most urgent and important of our defence requirements, and it has rightly received the special attention of Parliament.

37. The programme of the Royal Air Force approved by the House of Commons last year was designed to bring up the strength of the Force at home to a total of 123 squadrons with approximately 1,500 first-line aircraft. That programme is proceeding according to plan, but new developments in design will render it possible to make great additions to the striking power of the Force. The latest types of machine which will shortly come into production show such improvements in speed, range and carrying capacity as greatly to increase the operational effectiveness of the squadrons to be equipped with them. Accordingly, the programme already approved will be varied by effecting certain changes in composition and at the same time some addition will be made to the numbers of aircraft. Including four new auxiliary squadrons to be formed for co-operation with the Territorial Army, the new programme will increase the first-line strength of the Royal Air Force in this country, bringing up the total to approximately 1,750 aircraft, exclusive of the Fleet Air Arm. First-line figures taken by themselves are, however, a misleading criterion of comparative air strengths, as has been ex-

plained on many occasions, and in the present case the augmentation of offensive and defensive power which will result from the revised plans is greatly in excess of the numerical increase just mentioned.

38. The problem of co-ordinated air defence is occupying the constant attention of the Committee of Imperial Defence, with the co-operation of all the Departments concerned. Modern methods of defence and the correlation of offensive and defensive weapons are continually under review, and the scheme has been so drawn up as to ensure the necessary degree of flexibility and the full utilisation of the results obtained from continuous scientific research and experiment.

39. The Royal Air Force also has responsibilities in the general scheme of Imperial defence. With our wide Imperial responsibilities, the ability to reinforce a threatened area in sufficient time and in sufficient strength demands the location of air units at convenient places on the strategic air routes. The Government propose an increase amounting to approximately twelve squadrons for this purpose.

40. Mention has already been made of the four new auxiliary squadrons which will form a nucleus for co-operation with the Territorial Army. The five regular squadrons at present allotted for co-operation with the Regular Army will be reorganised to provide seven squadrons, each of twelve aircraft.

41. Large numbers of young men will be needed as pilots in the Regular Air Force, the Auxiliary Squadrons and the Reserve. Many airmen will be required for enlistment to meet the varied requirements of the Service; and many boys will be needed for apprenticeship in the skilled trades. The available sources of supply will all have to be brought into action, and the full co-operation of the public will be needed for success.

42. It is, of course, self-evident that the provision of air forces will not avail in war unless they are given the means not only to fight but to continue fighting. Skilled pilots require time to train, and aircraft production is a lengthy and complicated undertaking. The provision of adequate reserves in both men and material is an essential and urgent need, for without them the war effort of an Air Force could not be sustained.

43. Particular attention has therefore been given to the provision of these reserves in the shortest possible time, and it can now be said that adequate arrangements for this purpose are in train.

44. In the meantime the passive side of air defence measures has not been neglected. The Air Raid Precautions Department of the Home Office, set up in May of last year, has been actively engaged in the examination of the subject with Local Authorities and satisfactory progress has been made. Plans which have been prepared over a number of years are now approaching the stage when they can be put into operation, and estimates will be submitted in due course for the expenditure which will be required during the current year.

45. Before passing to another subject it must once more be emphasised that the plans for the improvement of our defensive forces in all three Services must be regarded as flexible and subject to variation in details from time to time. The whole field of preparation will have to be kept under constant review, and new conditions, whether arising from changes in the dispositions of other nations or from fresh developments in design and invention, must be met by corresponding variations in our own plans.

III.

46. In presenting to Parliament a scheme of improved defence so far-reaching in character and likely to involve so heavy a financial outlay, His Majesty's Government desire particularly to stress the fact that these proposals have resulted from a thorough study of the subject of defence as a whole. The examination of the problem was entrusted in the first instance to a Sub-Committee of the Committee of Imperial Defence. This Committee was composed of the Secretary to the Committee of Imperial Defence, the Permanent Secretary to the Treasury, the Permanent Under-Secretary of State for Foreign Affairs and the Chiefs of Staff of the three Defence Services. Their conclusions were submitted to the Defence Policy and Requirements Committee presided over by the Prime Minister, and on his invitation and in view of the importance of the industrial side of the question Lord Weir became a member of this Committee and gave his active assistance in formulating the recommendations which they made to the Cabinet. The Defence Policy and Requirements Committee has served in effect both as a General Purposes Committee of the Committee of Imperial Defence, and as a Committee of *liaison* between the Committee of Imperial Defence and the Cabinet.

47. Not only the general conception of the defence plans now brought forward, but every detail included in the scheme, have been the subject of close examination and scrutiny by the Defence Policy and Requirements Committee and subsequently by the whole Cabinet. In the opinion of His Majesty's Government they represent a thoroughly considered and well-balanced whole so far as conditions can be foreseen at this moment. In the future they will no doubt require adjustment from time to time as well as continuous supervision and pressure to ensure their execution. For this purpose the existing organisation for defence has been reviewed afresh and the changes which have been approved by His Majesty's Government were announced by the Prime Minister on the 27th February, 1936, in the following terms :—

> " This is a matter to which increasing attention has necessarily been devoted during recent months. It has been my experience that, apart altogether from defence questions, the all-round pressure of work has tended to increase in recent years, with a corresponding increase in the demands upon the Cabinet and, in particular, upon the Prime Minister.

" When, as was explained in March last, in spite of all the efforts of successive Governments to secure international disarmament, it became clear that we could no longer delay active preparations for remedying the deficiencies in our fighting services, and when, over and above that, we were faced with our responsibilities as a member of the League of Nations in the Italo-Abyssinian situation, it was obvious that in the near future there were bound to be large numbers of important and difficult defence questions requiring unremitting attention. As there appears to be no likelihood of any diminution in the other demands upon the time and attention of the Prime Minister, it has become clear in the course of a thorough examination of the whole problem that, for the time being at any rate, he must have some special assistance in regard to defence matters. This, of course, does not mean that the Prime Minister can divest himself of the final responsibility for directing the co-ordination of defence, nor can there be any weakening of the responsibility of the individual Service Ministers. Bearing in mind these principles, we have reached certain decisions. Before saying what these decisions are I should, perhaps, explain that the Committee of Imperial Defence—of which the Prime Minister is Chairman—has long been and must still remain an essential link in all matters of defence. This co-ordinating instrument must be in a continual state of development and adaptation to meet the circumstances of the time, and when the Government set themselves to the task of working out the defence proposals now under consideration, they set up last July a special Ministerial Sub-Committee, known as the Defence Policy and Requirements Committee, to keep the defensive situation as a whole constantly under review so as to ensure that our defence arrangements and our foreign policy are in line, and to advise the Cabinet and Committee of Imperial Defence in the light of the international and financial situation as to any necessary changes in policy or in the defence proposals. I have mentioned this important Sub-Committee so that the references to it that I shall make in announcing the decisions that have been reached may be intelligible.

" It has been decided that, while the Prime Minister will retain, as he clearly must, the Chairmanship of the Committee of Imperial Defence and of the Defence Policy and Requirements Committee, a Minister will be appointed as Deputy Chairman of these Committees, to whom the Prime Minister will delegate the following duties :—

(i) The general day-to-day supervision and control on the Prime Minister's behalf of the whole organisation and activity of the Committee of Imperial Defence ; the co-ordination of executive action and of monthly progress reports to the Cabinet, or any Committee appointed by them, on the execution of the reconditioning plans ; discernment of any points which either have not been taken up or are being pursued too slowly, and (in consultation with the Prime Minister or other Ministers or

Committees as required) of appropriate measures for their rectification;

(ii) In the Prime Minister's absence, taking the Chair at the Committee of Imperial Defence and the Defence Policy and Requirements Committee;

(iii) Personal consultation with the Chiefs of Staff together, including the right to convene under his chairmanship the Chiefs of Staff Committee whenever he or they think desirable;

(iv) The chairmanship of the Principal Supply Officers Committee.

"It will be the duty of the Deputy Chairman to make such recommendations as he thinks necessary for improving the organisation of the Committee of Imperial Defence.

"The position of the Chiefs of Staff Committee will be as follows—the individuals composing it have a double function: each advises his own political chief, and, acting together, the Committee preserves unimpaired the right to submit confidential reports of their collective military view to the Chairman or Deputy Chairman of the Committee of Imperial Defence. It is not proposed that meetings of the Chiefs of Staff Committee should normally take place under the Presidency of the Deputy Chairman. He will supplement the present activities and initiative of the Chiefs of Staff Committee by guidance and initiative of his own, his function being to ensure that every aspect is fully considered and that difficulties and differences are frankly faced.

"As I said earlier, the Minister will be in a position to make recommendations as to any improvement that he thinks necessary in the organisation of the Committee of Imperial Defence. In any event, and for purposes of co-ordinated planning, the existing Joint Planning Committee, which consists of the Directors of Plans in the three Service Departments, will be supplemented by three officers drawn respectively from the Navy, Army, and Air Force, who will be graduates of the Imperial Defence College.

"The three new officers will hold official positions on the staffs of their respective Departments. Their work in their own Departments will be chiefly that of obtaining the necessary material for the preparation of Joint Plans. But their main work will be on collective plans prepared by the Joint Planning Committee for submission to the Chiefs of Staff Committee.

"In addition, steps have been approved for the strengthening of the Secretariat of the Committee of Imperial Defence."

IV.

48. It will be seen from the foregoing paragraphs that the new arrangements contemplated are intended to serve two purposes, namely, to provide an improved and strengthened apparatus for the

consideration of Defence problems as a whole and to ensure the fullest and most effective use of the industrial capacity and the man power available for production of material in the country. The second of these two objectives requires some further elaboration.

49. The problem before us differs materially from that with which we were faced in the Great War. At that time the whole energies of the country were devoted to winning the war and nothing else. Special powers were entrusted to the Government which enabled them to exercise complete control over industry and to direct it into any desired channel. To-day we are at peace and moreover we are living in a period of great commercial and industrial activity. What we have to do is to carry through, in a limited period of time, measures which will make exceptionally heavy demands upon certain branches of industry and upon certain classes of skilled labour, without impeding the course of normal trade. This will require the most careful organisation and the willing co-operation both of the leaders of industry and of Trade Unions if our task is to be successfully accomplished. But the Government have every confidence that these conditions will be fulfilled.

50. Consideration of the position showed that there were really two different requirements to be met. One has already been stated in the foregoing paragraph, and concerns the carrying out of a peace-time programme. The other concerns our readiness for war itself. Modern war conditions involve a vast expenditure of munitions and equipment, and in the early months of the Great War there was a tragic loss of life in consequence of the lack of adequate reserves. If we are to avoid a repetition of that tragedy in any future war and to provide by our preparations an increased deterrent, we must prepare ourselves either by accumulating immense reserves or by so organising industry that it can rapidly change over at the vital points from commercial to war production should the necessity arise. The first alternative, however, is only feasible within limits, and beyond that is ruled out not only on account of its cost, but because weapons and methods of warfare are continually changing, and these accumulated reserves might therefore well become obsolete before they were required. His Majesty's Government, therefore, have turned to the second alternative, and they have already taken some preliminary steps towards putting it into operation.

51. Our present sources of supply are the Government factories and the normal Government contractors, who, in peace, manufacture various types of armament. The Government factories are chiefly responsible for a specialised kind of output which is generally non-existent elsewhere. This includes the production of explosives and propellants, the filling of shells and cartridges and the manufacture of fuzes, bombs, mines, and torpedoes. To meet present requirements in these categories it will be necessary to extend or duplicate existing Government factories, and both vulnerability of site and the needs of the Special Areas will receive consideration.

52. The normal Government contractors supply warships, aircraft, artillery, machine guns, tanks, lorries, and miscellaneous

stores of every description. They also supply a great variety of articles for export and home consumption and for both purposes they subcontract for materials, fittings, and stores. To some extent it will be possible for them to contribute to the increased output required by extending their plant or workshops. But in the course of investigation it soon became apparent that, even for the purpose of the peace-time programme, the field would have to be extended to other firms not normally engaged in armament work, and at the same time it was clear that this extension would to some extent assist in the establishment of the organisation necessary to ensure rapid expansion of production in time of war.

53. In connection with the approved programme for the Royal Air Force, steps are already being taken to extend the field of production by placing orders with firms who do not ordinarily manufacture for the Force or for civil aviation. This process of extension will have to be further enlarged to meet the programmes for the Navy and Army, but even so something more will be required.

54. In order satisfactorily to provide for our needs both in peace and war, His Majesty's Government have decided to create a reserve source of supply which would be available in case of emergency. The method of procedure contemplated is to select a number of firms who do not normally make warlike stores but who are suitable for the purpose by reason of their experience and their possession of a skilled staff of engineers and workmen. Arrangements would then be made with these firms for the laying down of the necessary plant and machinery for a given output of selected articles and sufficient orders in peace time would be guaranteed to allow of the requisite training in the work of production. The particular circumstances will vary in connection with every firm and with different types of product. Wide elasticity of arrangements must therefore be provided for, but the underlying principle is that each selected firm, while maintaining and developing its normal civil trade, will agree to use its organisation and commercial structure to set up some measure of munition production and thus create the reserve source of supply.

55. There remain two other important features of the Government's plans for the organisation of production which must be mentioned.

56. The first concerns the supply of skilled labour, for which there will necessarily be a largely increased demand. In some of the skilled occupations there is already noticeable the shortage inevitable when large and sudden demands are made upon labour supplies after a period of depression. It will be for the industries concerned, with such guidance as the Government can give, to make sure that vital processes are not held up for want of the necessary craftesmen.

57. The second point concerns costs and prices. His Majesty's Government are determined that the needs of the nation shall not

serve to pile up extravagant profits for those who are called upon to meet them. They are confident that industry as a whole has no desire to exploit the situation, and, indeed, they have already received satisfactory assurances from the Federation of British Industries of their readiness to collaborate. But when regular contractors are required to work nearly to their full capacity on Government orders, and when large numbers of firms are asked to undertake work which is new to them and which will have to be produced on equipment of which they have had no previous experience, the ordinary methods of contracting do not offer adequate safeguards for ensuring that prices bear their proper relation to actual costs.

58. His Majesty's Government have given much time and thought to this matter and they have been materially aided by the experience gained during the last few months by the Air Ministry working under conditions of exceptional pressure. On the one hand, it is important to retain the goodwill of industry, for in peace time firms cannot be compelled to undertake contracts on terms which they consider unreasonable. On the other hand, difficulties are bound to arise in dealing with so many and such various sources of supply, where there are not only contractors, but also sub-contractors and sub-sub-contractors concerned. There will be new problems where firms require financial assistance in order to lay down new plant and hold it at the Government's disposal, and these cases will be particularly urgent, since until they are met it will not be possible to make a start. It will be necessary also to co-ordinate the demands of the three Services so that proper priority shall be observed and competition between them, which might lead to higher prices, avoided.

59. His Majesty's Government believe that all these difficulties can be overcome through the organisation they have in mind. As regards the principal contractors, contact will be made with them by the Service Departments, while in the case of sub-contractors in secondary or ancillary sections of organised industry, it is intended that communications shall pass through small committees to be appointed by the trade organisations themselves. Control to prevent excessive profits will be effectively exercised by inspection of books, adequate technical costings, audits on behalf of the State and arbitration in cases of dispute. The Government are satisfied that this can be done without impairing the confidence and enterprise of contractors undertaking novel and difficult tasks.

60. Co-ordination of Service requirements will be effected through the existing Principal Supply Officers Committee Organisation of the Committee of Imperial Defence, and the new Deputy Chairman of the Committee of Imperial Defence will as Chairman of this Committee be able to supervise the whole system of supply and correct any deficiencies that may be found to arise.

61. Treasury control will, of course, be maintained throughout the whole field. It will be important, however, to see that the work

is not delayed by the over-elaboration of financial safeguards, and new methods of procedure are being worked out which will ensure the effectiveness of financial control without impairing the continuity of progress.

62. From what has already been said as to the necessary flexibility of this programme, and in view of the uncertainty which must exist as to the rate of progress possible over so large a field, it will be realised that any attempt to estimate the total cost of the measures described would be premature at this stage. The original estimates for the coming year, which will shortly be before the House, will themselves require to be supplemented by provision for further defence measures referred to in this Paper ; those for the following years must necessarily be larger. In the absence of any scheme of general disarmament it must be anticipated that the annual cost of maintenance for the reorganised Services must remain on a higher level, and will in all likelihood substantially exceed the original estimates about to be submitted.

March 3, 1936.

EXPENDITURE FOR NAVAL PURPOSES OF THE PRINCIPAL FOREIGN POWERS.

UNITED STATES NAVY.

APPROPRIATION BILL, 1935 (July 1, 1935, to June 30, 1936).

Appropriation Title.	Appropriations.	
	1935–36. Dollars.	1934–35. Dollars.
Salaries, office of the Secretary of the Navy	163,380	154,800
Salaries, General Board	12,560	11,304
Salaries, Naval Examining Board	10,600	9,540
Salaries, Compensation Board	6,840	6,156
Contingent Expenses Navy Department	85,000	75,000
Printing and Binding	410,000	375,000
Pay, Miscellaneous	1,062,700	862,280
Contingent, Navy	17,500	15,000
State, Marine Schools	190,000	189,407
Care of lepers, Guam	35,000	35,000
Operation and conservation of Naval Fuel Reserve	63,000	59,603
Naval Research Laboratory	310,000	183,116
Salaries, Office of Naval Records and Library	34,080	30,672
Salaries, office of Judge Advocate General	116,780	104,940
Salaries, office of Chief of Naval Operations	70,000	61,830
Salaries, Board of Inspection and Survey	17,240	15,516
Salaries, Naval Communications	125,000	108,720
Salaries, office of Naval Intelligence	56,080	32,760
Recreation for enlisted men	282,200	465,582
Contingent, navigation	—	5,000
Gunnery and engineering exercises trophies	50,000	35,229
Instruments and supplies	630,000	497,390
Ocean and lake surveys	70,000	52,910
Naval training station, California	162,975	155,150
Naval training station, Rhode Island	115,559	65,000
Naval training station, Great Lakes	250,000	6,200
Naval training station, Norfolk.	226,468	215,950
Naval Reserve	7,352,825	2,745,509
Naval Reserve Officers' Training Corps	85,000	74,314
Naval War College	—	103,257
Salaries, Bureau of Navigation	460,000	407,943
Salaries, Hydrographic Office	397,000	337,356
Contingent and miscellaneous expenses, Hydrographic Office	152,380	115,194
Salaries, Naval Observatory	169,460	149,994
Contingent, etc., expenses, Naval Observatory	21,500	20,000
Engineering	19,662,000	15,542,000
Engineering Experimental Station, Annapolis		
Salaries, Bureau of Engineering.	297,500	268,470
Bureau of Construction and Repair	18,288,000	13,662,200
Salaries, Bureau of Construction and Repair	347,479	312,670
Ordnance and ordnance stores	21,200,000	10,545,600
Torpedoes and appliances		
Purchase and manufacture of smokeless powder		
Salaries, Bureau of Ordnance	149,000	134,703
Naval Home, Philadelphia	190,000	—

UNITED STATES NAVY—*continued.*

Appropriation Title.	Appropriations. 1935–36. Dollars.	Appropriations. 1934–35. Dollars.
Pay, Subsistence and transportation	168,283,083	137,439,992
Maintenance, supplies and accounts	8,350,540	7,559,000
Fuel and transportation	7,812,200	6,633,658
Salaries, Bureau of Supplies and Accounts	765,100	683,670
Medical Department	2,179,400	1,894,666
Care of the dead	70,000	68,000
Salaries, Bureau of Medicine and Surgery	83,240	69,048
Maintenance, Yards and Docks	7,952,800	6,459,250
Contingent, Yards and Docks	140,000	117,635
Salaries, Bureau of Yards and Docks	276,800	251,450
Public Works	1,475,000	2,000,000
Aviation, Navy	40,732,310	18,643,320
Salaries, Bureau of Aeronautics	337,000	237,078
Pay, Naval Academy	851,835	697,770
Current and miscellaneous expenses, Naval Academy	90,000	77,300
Maintenance and repairs, Naval Academy	986,165	774,716
Pay, Marine Corps	16,592,904	14,390,612
Pay, civil employees, Marine Corps	266,668	241,510
General expenses, Marine Corps	6,908,538	6,016,325
Increase of the Navy—Construction and Machinery	*88,310,000	32,342,000
Increase of the Navy—Armour, Armament, and Ammunition	32,485,000	6,277,334
Modernisation of vessels	—	†470,000
Total Annual appropriation	458,293,689	291,632,399

* For the continuance of the construction of 14 destroyers and 6 submarines commenced in the fiscal year 1935, and for the commencement of 2 cruisers of sub-category (*b*), authorised 1929, and 1 aircraft carrier, 15 destroyers and 6 submarines, authorised in 1934.

In addition $6,000,000 of the balance remaining on certain votes on June 30, 1935, is reappropriated for Increase of the Navy, and a further supplementary $6,000,000 has been voted.

† Towards the modernisation of New Mexico, Mississippi, and Idaho authorised by an Act, February 28, 1931, to remain available until expended.

A sum of 238 million dollars of the total of 3,300 million dollars authorised by the National Industrial Recovery Act (1933) for the expenditure on public works has been allocated for naval construction. This sum provides for the construction of 32 vessels for which contracts have now been placed; 46 million dollars is to be expended during the fiscal year 1933–34, 105 million dollars during the fiscal year 1934–35, and the remainder during the fiscal year 1935–36.

FRENCH NAVY.

ESTIMATES, 1935–36.

The figures for 1935–36, including the vote for new construction, as compared with 1934–35 are as follows :—

	1935–36. Francs.	1934–35. Francs.
Ordinary	1,372,255,139	1,445,795,448
Extraordinary . . . . } Air Service . . . . . }	2,023,464,459	1,228,998,549 268,489,497
Total	*3,395,719,598	2,943,283,494

* A further extraordinary vote of 138,000,000 francs has been approved.

ROYAL ITALIAN NAVY.

ESTIMATES, 1935–36.

	1935–36. Lire.	1934–35. Lire.
ORDINARY EXPENDITURE.		
General Expenses	5,023,500	5,278,000
Pensions	98,070,000	96,070,000
Lighthouses and Pilotage . .	5,589,000	6,302,000
Maintenance, Construction, Armaments, Establishments, and Coast Works . . .	1,055,518,000	1,028,140,000
Total . . .	1,164,200,500	1,135,790,000
EXTRAORDINARY EXPENDITURE.		
General expenses of the Navy and Various	466,000,000	48,990,477
Transfer of Funds	40,000,000	40,000,000
Grand Total . . .	1,670,200,500	1,224,780,477

GERMAN NAVY.

ESTIMATES, 1934–35.

	1935–36.	1934–35. Reich Marks.	1933–34. Reich Marks.
Gross	No figures available	236,243,200	186,243,200
Appropriations in aid		3,238,050	3,238,050
Net . .		233,005,150	183,005,150

BRITISH AND FOREIGN NAVIES.

PRINCIPAL OFFICIALS.

GREAT BRITAIN.

First Lord.—The Right Hon. Viscount Monsell, G.B.E.

First Sea Lord and Chief of Naval Staff.—Admiral of the Fleet Sir Ernle M. Chatfield, G.C.B., K.C.M.G., C.V.O., D.C.L. (Oxon.).

Second Sea Lord and Chief of Naval Personnel.—Admiral Sir Martin E. Dunbar-Nasmith, V.C. K.C.B.

Third Sea Lord and Controller.—Vice-Admiral Sir R. G. H. Henderson, K.C.B.

Fourth Sea Lord and Chief of Supplies and Transport.—Vice-Admiral P. L. H. Noble, C.B.. C.V.O.

Deputy Chief of Naval Staff.—Vice-Admiral Sir W. M. James, K.C.B.

Assistant Chief of Naval Staff.—Rear-Admiral C. E. Kennedy-Purvis, C.B.

Parliamentary and Financial Secretary.—Right Hon. Lord Stanley, M.C., M.P.

Civil Lord.—Kenneth M. Lindsay, Esq., M.P.

Permanent Secretary.—Sir Oswyn A. R. Murray, G.C.B.

FOREIGN POWERS.

Country.	Minister of Marine.	Chief of Staff.
Argentina	Captain Eleazer Videla	Captain Léon Scasso
Brazil	Vice-Admiral Protogenes Pereira Guimarães	Rear-Admiral Henrique Aristides Guilhem
Chile	Don Emilio Bello Codecido (Minister of National Defence)	——
	Rear-Admiral Reyes del Rio (Director-General of the Navy)	Captain Vicente Merino.
China	Admiral Chen Shao-Kwan (Minister of Naval Affairs)	Rear-Admiral Chen Hsiun Yung (Vice-Minister)
Cuba	——	Captain G. del Real
Denmark	Th. Stauning	Rear-Admiral A. G. Topsoe Jensen
	Vice-Admiral H. Rechnitzer (Chief of Naval Defence and Director of the Naval Ministry)	
Ecuador	Senor Octavio G. Ycaza	Captain de Navio Anda (Director of the Fleet)
Estonia	General Lill (Minister of Defence)	General N. Reek
Finland	A. Oksala (Minister of Defence)	Major-General Oesch
	Lieut.-General V. Öesterman (Chief of Army and Navy)	
France	M. François Pietri	Vice-Admiral G. E. J. Durand-Viel
Germany	General von Blomberg (Minister of Defence)	Vice-Admiral Foerster (C.-in-C. of Fleet)
	Admiral Dr. Raeder (Chief of Navy Department (Admiralty)	
Greece	Admiral Dousmanis	Rear-Admiral Sake Nariou (C.-in-C.)
Italy	Signor Mussolini	Admiral D. Cavagnari
Japan	Admiral M. Osumi, C.B.	H.I.H. Prince Hiroyasu Fushimi
Latvia	General Balodis (Minister of Defence)	Captain Spade (Chief of Naval Forces)
Lithuania	General Sniukstas (Minister of War)	——
Mexico	General Quiroga (Minister of War and Marine)	Rear-Admiral P. O. Blanco
Netherlands	Dr. Colijn (Minister of Defence) (temporarily)	Rear-Admiral J. de Graaf
Norway	J. I. Kobro (Minister of Defence)	Rear-Admiral E. Otto
Paraguay	Dr. Victor Rojas (Minister of Defence)	Lt.-Cdr. D. M. Aponte (Director of the Navy)
Peru	Captain Hector Mercado (Minister of Marine and Aviation)	Captain Tomás Pizarro
Poland	Marshal Pilsudski	Rear-Admiral J. Swirski (Chief of Navy Department)
Portugal	Captain Anibal Mesquita Guimaraes	Rear-Admiral Antonio da Camara Melo Cabral
Roumania	Admiral Barbuneanu	Commander E. Rosca
Siam	Luang Bibul (Minister of Defence)	Eng. Captain Phya Chakrakich (C-in-C.)
Soviet Union	N. E. Voroshilov (President of Committee of Defence)	V. M. Orlov
Spain	Don Pedro Rahola	Vice-Admiral Xavier de Salas y Gonzalez
Sweden	Ivar Vennerström (Minister of Defence)	Vice-Admiral Lybeck
Turkey	Captain Houloussi (Under-Secretary for the Navy)	——
United States	C. Swanson (Secretary of the Navy)	Admiral W. H. Standley (Chief of Naval Operations)
Uruguay	General Domingo Mendivil (Minister of War and Marine)	
	Dr. Augusto Sado (Under-Secretary)	Rear-Admiral Arturo Juambeltz (Director of Navy)
Yugoslavia	General Stoyanovic (Minister of War and Marine)	Captain S. Banekovic
	Rear-Admiral M. L. Polic (Head of Navy)	

BRITISH AND FOREIGN NAVAL ATTACHÉS.

BRITISH NAVAL ATTACHÉS ACCREDITED TO FOREIGN COUNTRIES.

To :—

Albania, Bulgaria, Greece, Italy, Yugoslavia, Roumania, and Turkey: Naval Attaché, Captain H. Pott, M.V.O.R.N. (appointed 26th April, 1934); Assistant Naval Attaché, Commander (E.) R. Cobb (appointed 23rd August, 1935); Headquarters, Rome, Italy.

Belgium, France, Netherlands, Portugal and Spain: Naval Attaché, Captain C. F. Hammill, R.N. (appointed 8th October, 1934); Assistant Naval Attaché, Commander (E.) R. Cobb (appointed 23rd August, 1935); Headquarters, Paris, France.

Denmark, Esthonia, Finland, Germany, Latvia, Lithuania, Norway, Poland and Sweden: Naval Attaché, Captain G. C. Muirhead-Gould, D.S.C., R.N. (appointed 21st July, 1933); Assistant Naval Attaché, Commander (E.) R. Cobb (and Assistant to Naval Attachés, Paris and Rome); Headquarters, Berlin, Germany.

Japan and China: Naval Attaché, Captain J. G. P. Vivian, R.N. (appointed 6th January, 1933); Assistant Naval Attaché, Commander (E.) G. C. Ross, R.N. (appointed 15th April, 1933): Headquarters, Tokyo, Japan.

U.S.A., Cuba, Mexico, and Panama: Naval Attaché, Captain F. C. Bradley, R.N. (appointed 19th June, 1935); Assistant Naval Attaché, Engineer-Commander A. L. P. Mark-Wardlaw (appointed 28th July, 1934): Headquarters, Washington, U.S.A.

South America, including the Argentine Republic, Brazil, Chile, Ecuador, Peru, and Uruguay: Naval Attaché, Captain R. H. C. Halifax, R.N (appointed 1st July, 1933); Headquarters, Buenos Aires.

Siam: Naval Attaché, Commander G. R. G. Allen, O.B.E., R.N. (appointed 28th May, 1935); Headquarters, Bangkok.

FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN.

From :—

Argentine: Captain Mario Fincati. Argentine Naval Commission:—Captain Mario Fincati, Commander Francisca Renta, Commander M. A. Parra, 171, Victoria Street, S.W.1.

Belgium: General Major Albert Nyssens (Military Attaché), Belgian Embassy, 103, Eaton Square, S.W.1.

Brazil: Engineer Captain Natal Arnaud, Brazilian Embassy, 19, Upper Brook Street, Mayfair, W.1.

Chili: Commander Don Francisco Beduneau, 76, Victoria Street, S.W.1. Chilian Naval Commission: Rear-Admiral C. Rogers, C.N. (retd.), 76, Victoria Street, S.W.1.

China: Post Vacant.

Denmark: Post Vacant.

Finland: Commander Vainö Lauri Kopio (absent), Commander Holger Gröndahl (acting), 37, Smith Square, Westminster, S.W.1.

France: Captain de Frégate Comte du Tour, French Embassy, Albert Gate House, S.W.1.

Germany: Captain Erwin Wassner; Assistant Naval Attaché, Lieutenant Wilhelm Rollmann, German Embassy, 9, Carlton House Terrace, S.W.1.

Greece: Post vacant.

Italy: Captain Count Ferrante Capponi; Assistant Naval Attaché Capitano del Genio Navale Gino Iori, 4, Three Kings' Yard, Davies Street, W.1.

Japan: Captain R. Fujita, I.J.N.; Assistant Naval Attachés, Lieut.-Commander C. Yamazumi, I.J N., Lieutenant M. Nango, I.J.N., Broadway Court, Westminster, S.W.1.

Norway: Post vacant.

Peru: Post vacant.

Poland: Post vacant.

Portugal: Post vacant.

Roumania: Captain Georghe St. Dumitrescu, Assistant Captain Cezar Marinescu, 4, Cromwell Place, S.W.7.

Spain : Capitan de Navio Manuel Medina, 24, Belgrave Square, S.W.1. Spanish Naval Commission: Capitan de Navio Manuel Medina, 64, Victoria Street, S.W.1.

Sweden : Commander G. E. F. Boldt-Christmas, Swedish Legation, 27, Portland Place, W.1.

U.S.A.: Captain W. S. Anderson, U.S.N.; Assistant Naval Attachés, Captain J. A. Furer, U.S.N. (C.C.), Commander Wilder Du Puy Baker, U.S.N., Lieutenant Elliot B. Strauss, U.S.N., Lieutenant H. A. Guthrie, U.S.N., Lieut.-Commander L. C. Stevens, U.S.N. (C.C.), 4, Grosvenor Gardens, S.W.1.

Uruguay : Post vacant.

Yugoslavia : Colonel George S. Glischitch, Naval and Military Attaché, and Air Attaché, 195, Queen's Gate, S.W.7.

STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1935.

The net total of the Navy Estimates for 1935 is £60,050,000, and exceeds the net total for 1934 by £3,500,000.

Of this increase, £245,196 is required in order to make normal progress with New Construction, under Votes 8 and 9; there is a rise of £166,200 in the Non-Effective Votes, which is automatic; an increase of £535,000 in the expenditure on the Fleet Air Arm; and a rise of £2,553,604 in the provision for the Maintenance of the Fleet, which is due mainly to the cost of necessary large repairs and modernization of Capital Ships in view of the prolongation of their lives by the London Naval Treaty, and to expenditure involved in partially making good deficiencies in defensive material, stores and equipment.

Provision is made in Vote A for an increase of slightly more than 2,000 in the personnel of the Fleet. A substantial part of this total represents an increase due to the replacement of old ships by new ships, including the Cruisers of the 1931 and 1932 Programmes, and to the expansion of the Fleet Air Arm, and the balance is required for meeting the growing needs of the existing Fleet under modern conditions and for making good various deficiencies in personnel.

The New Construction Programme for 1935 is as follows:—

Three Cruisers (Southampton, late Minotaur, type).
One Leader and eight Destroyers.
Three Submarines (one Minelayer Submarine, one "P" or General Service, and one "S" or Patrol type).
One Submarine Depot Ship.
Four Sloops (three Minesweeping and one Convoy Sloop).
One Surveying Ship.
Seven Small Vessels (two Coastal Sloops, one small Minelayer, two Gate Vessels, and two Trawlers).

The building of new Cruisers, Destroyers and Submarines continues to be governed by the London Naval Treaty until the 31st December, 1936. Until that date, the British Commonwealth of Nations may only lay down, under the Treaty, replacement tonnage for Cruisers and Submarines becoming over-age before the end of 1939 and for Destroyers becoming over-age before the end of 1938, and these limitations have, of course, been kept in mind in fixing the Programme for 1935.

The number of Cruisers to be laid down is three—the normal number since the Treaty. As was explained at the time, the fourth Cruiser included in the 1933, and ultimately transferred to the 1934 Programme was added with a view to providing the Commonwealth

Government with a replace ship for H.M.A.S. Brisbane, which requirement has now been satisfied.

The number of Destroyers and Submarines are the same as in previous Programmes since the Treaty.

As in previous years, allowance has been made for anticipated under-spending in contract work, etc.

B. EYRES MONSELL.

ADMIRALTY,
March 1, 1935.

NOTES ON MATTERS OF GENERAL INTEREST.

TWENTY-FIFTH ANNIVERSARY OF HIS MAJESTY'S ACCESSION.

As part of the celebrations to mark the Twenty-fifth Anniversary of His Majesty's Accession, a review of the combined Home and Mediterranean Fleets will be held at Spithead in July. After the Review, it is hoped that the King, in His Majesty's Yacht Victoria and Albert, will lead the Fleets to sea and will witness a tactical exercise.

For a week during May a number of ships of the Home Fleet will be present off Southend, and others will be moored in the Thames, to afford an opportunity to the citizens of London to see something of His Majesty's ships.

VISIT OF H.R.H. THE DUKE OF GLOUCESTER TO AUSTRALIA.

His Royal Highness the Duke of Gloucester proceeded to Australia in H.M.S. Sussex to represent His Majesty the King at the centenary celebrations of the State of Victoria. He visited New Zealand in H.M.A.S. Australia, and returns in her to England, arriving at Portsmouth at the end of March. On his way home His Royal Highness is visiting Kingston, Jamaica.

DISTRIBUTION OF THE FLEET.

Battleships and Battle Cruisers.

The Ramillies, having completed large repairs, joined the Mediterranean Fleet last September to take the place of the Royal Oak, which was taken in hand for large repairs at the end of June. The Warspite and Malaya were taken in hand for large repairs and modernization in April and October 1934, respectively. The Repulse is in hand for large repairs at Portsmouth.

Redistribution of Capital Ships in the Home and Mediterranean Fleets.

It has been decided to station the "Queen Elizabeth" Class battleships in the Mediterranean and the "Royal Sovereign" Class in the Home Fleet, in order to obtain homogeneity. The effect of the large repair programme, however, will fall heavily on the "Queen Elizabeth" Class in the next few years, and as the Mediterranean loses one Capital Ship by the exchange, it has been decided to station the Battle Cruisers in the Mediterranean, so as to make the numbers of Capital Ships in the two Fleets approximately equal.

Aircraft Carriers.

The Courageous and Furious have been exercising with the Mediterranean Fleet during the Spring Cruise, but will rejoin the Home Fleet for the Combined Fleet Exercises, and will return with it to England at the end of March.

The Eagle has been relieved on the China Station by the Hermes, and is temporarily serving with the Mediterranean Fleet; she will return to England in April and reduce to reserve. The Glorious, after completion of her large repairs next summer, will return to the Mediterranean before the end of the year.

CRUISERS.

Mediterranean Station.

The Arethusa (1931 Programme) will join the Third Cruiser Squadron on completion, and the Galatea (1932 Programme) will on completion relieve the Despatch in the same Squadron.

East Indies Station.

The Norfolk will sail for the East Indies in March to relieve the Hawkins as Flagship. The Hawkins will return to England in the same month, and will probably be placed in Reserve.

The Emerald completed her large repairs in August, 1934, and rejoined the East Indies Squadron in November. The Enterprise is at present undergoing large repairs at home, and is expected to rejoin the East Indies Squadron early in 1936.

The Colombo, which has been employed temporarily as a relief for the Emerald and later for the Enterprise, will return to England shortly before the Enterprise leaves for her station.

America and West Indies Station.

The Norfolk left the station in November to recommission for service in the East Indies. Her place as Flagship has been taken by the York.

The Ajax (1931 Programme) will take the place of the York in the South American Division in the summer. The Apollo (1932 Programme) will relieve the Danae later in the year.

Africa Station.

The Dorsetshire returned to England in February to refit, and will recommission for service on the China Station in May. The Carlisle has become the Commander-in-Chief's Flagship temporarily, until the Amphion (1931 Programme) arrives on the station later in the year to take over the duties of Flagship.

China Station.

The Cumberland has returned to England, and is in hand for large repairs which, it is anticipated, will be completed during the summer of 1936. The Suffolk will return to England and be taken in hand for similar repairs in August 1935.

LEADERS AND DESTROYERS.

The vessels of the 1931 Programme, viz., the Leader Faulknor and eight Destroyers of the "Fearless" Class, will, it is expected, all have joined the Home Fleet by June, to replace vessels constructed during the war.

The Leader Duncan and eight vessels of the "Defender" Class from the Mediterranean have been exchanged with the Leader Keppel and eight Destroyers of the modified "V" and "W" Class on the China station. The latter will be relieved in the Mediterranean by the vessels of the 1933 Programme early in 1936.

SUBMARINES.

A re-organisation of Submarine Flotillas is in progress. The First Submarine Flotilla in the Mediterranean will in future consist of the three fast vessels of the "Thames" Class and three "S" type vessels. The Rover, Regent and Regulus are joining the Fourth Submarine Flotilla on the China station, where a number of the Submarines now in commission are to undergo repairs. As a result, all the later large Patrol Submarines will be concentrated in the Fourth Flotilla, with consequent simplification of organisation and economy of maintenance. The Second Submarine Flotilla, attached to the Home Fleet, remains at the same strength, but three of the "L" Class are being replaced by the later "L.50" type.

YACHTS.

The old Admiralty yacht Enchantress having been placed on the sale list, the Bittern (a convoy sloop of the 1933 Programme) has been renamed Enchantress, and is being adapted in order that she may be used when necessary by the Board of Admiralty, in addition to carrying out her normal duties.

SLOOPS.

The new sloops Grimsby, Leith, Wellington, and Lowestoft have replaced older sloops abroad.

The new sloop Deptford (1933 Programme) will replace the Lupin on foreign service in the course of the year. The new sloop Londonderry (1933 Programme) will relieve the Hastings in the Red Sea, and the latter will replace an older sloop on Fishery Protection duties.

The Bridgewater arrived on the Africa Station in February 1935, having been transferred from China to replace the Daffodil, which has been scrapped. The Weston from the Africa Station will exchange stations with the Penzance in the Red Sea in September, 1935.

The four sloop minesweepers of the 1931 and 1932 Programmes have joined the Minesweeping Flotilla in Home Waters, and the Speedwell, the sloop minesweeper of the 1933 Programme, will join the Flotilla this year.

The coastal sloop Kingfisher of the 1933 Programme will relieve an older ship on Fishery Protection duties.

GUNBOATS.

The Robin has been completed, and has joined the West River Flotilla on the China Station.

CO-OPERATION WITH THE DOMINIONS, ETC.

THE COMMONWEALTH OF AUSTRALIA.

The Cruiser Brisbane is to be replaced during the forthcoming financial year by the Sydney (late Phaeton), now completing on the Tyne, which has been taken over by the Commonwealth Government. It is expected that the Brisbane will bring the Sydney's crew to England about August 1935, and will subsequently be scrapped here.

In addition to the loan of senior officers to Australia, the system of exchanging a certain number of junior officers continues.

Opportunity was taken of the visit of H.R.H. the Duke of Gloucester to Australia in H.M.S. Sussex to revive the practice of periodically exchanging cruisers with the R.A.N. H.M.A.S. Australia will be attached to the First Cruiser Squadron in the Mediterranean for about a year, and H.M.S. Sussex will form part of the Australian Squadron until her return to the Mediterranean in time for the Combined Fleet Exercises in March, 1936, in which both exchanged cruisers will take part.

Plans, machinery, and certain material have been supplied from England for the new Australian Sloop Yarra, now being built at Sydney, and a second vessel of this type has recently been ordered by the Commonwealth Government for construction there.

THE DOMINION OF NEW ZEALAND.

The two sloops Veronica and Laburnum of the Royal Navy, which have been employed on the New Zealand station since the war, were replaced during the present financial year by the new sloops Leith and Wellington.

THE UNION OF SOUTH AFRICA.

The reorganisation of the South African Naval Service, which resulted from the discussions with the Union Government in the summer of 1933, is now complete, and progress is being made with the new system of training the South African R.N.V.R.

THE INDIAN EMPIRE.

Interesting and important naval events during the year have been the passing of the Indian Navy (Discipline) Act in August, 1934, and the consequent grant to the Royal Indian Marine of the title "Royal Indian Navy."

The new sloop Indus, under construction at Hebburn-on-Tyne, for the Royal Indian Navy, was launched on 24th August, 1934, and will probably be completed in the present month.

COLONIAL ROYAL NAVAL VOLUNTEER RESERVE FORCES.

Adequate progress has been maintained. The sloop Laburnum, which has been relieved on the New Zealand station, has been accepted by the Straits Settlements Government as a drill ship to be stationed at Singapore.

The public-spirited generosity of Sheik Ali bin Salim, K.B.E., who has given £1,200 for the purpose, has made it possible to provide the Kenya R.N.V.R. with permanent headquarters, which will very greatly increase the efficiency of the force.

FLEET ACTIVITIES ABROAD.

HOME FLEET.

As in the previous year, a part of the Home Fleet, under the Commander-in-Chief, Admiral the Earl of Cork and Orrery, K.C.B., visited the British West Indies in February, 1935.

MEDITERRANEAN FLEET.

The First Battle Squadron and other units of the Mediterranean Fleet were present at Split when the body of His late Majesty King Alexander of Yugo-Slavia was conveyed thither in the warship Dubrovnik, and rendered suitable honours. Subsequently, Admiral Sir William Fisher, K.C.B., C.V.O., Commander-in-Chief of the Mediterranean Fleet, proceeded to Belgrade, and represented the Royal Navy at the funeral. A detachment of Seamen and Royal Marines from the Mediterranean Fleet was also present.

On the occasion of the visit of His Majesty the King of Italy to Italian Somaliland in October, the Penzance was present at Aden and Berbera, and rendered suitable honours while the Royal Yacht was in harbour.

RED SEA.

During the war in the Yemen in the spring of 1934, British subjects were effectively protected by H.M. Ships Enterprise and Penzance.

The usual anti-slavery patrols have been carried out in the Red Sea.

AMERICA AND WEST INDIES.

The Dundee visited St. Mary's City, Maryland, in July, 1934, for the Tercentenary Celebrations.

On passage to the West Indies in January, 1935, the Frobisher, Training Cruiser for Naval Cadets, and the Guardian, went to the aid of the British ship Valverda, a vessel of nearly 9,000 tons gross, which was on fire and unmanageable. When the weather moderated, the Frobisher took the Valverda in tow for Bermuda, accompanied by the Admiralty Oiler Orangeleaf which had been sent from Bermuda for this purpose. The ships reached Bermuda (a distance of 880 miles) on the 1st February, the Valverda having been in tow for seven days.

CHINA.

Admiral Sir Frederick Dreyer, K.C.B., C.B.E., Commander-in-Chief of the China Station, and a number of H.M. ships, visited Japan in the autumn of 1934 and were cordially received. The Commander-in-Chief also paid a special visit to Japan in his Flagship in order to attend the funeral of the late Fleet Admiral Marquis Togo in June, 1934.

H.M. ships have been stationed throughout the year at coast and river ports in China in order to safeguard British interests, and ships have been sent to various localities which have been threatened by trouble.

On the occasion of the piracy of the British ship Shuntien, south-east of Taku in June, 1934, the Aircraft Carrier Eagle and the Destroyers Veteran, Wren, and Witch were despatched to the scene of the outrage. The pirates were quickly located in the neighbourhood of the Yellow River by aircraft of the Fleet Air Arm, and hastened to release their prisoners. Amongst these were five British subjects (of whom two were Lieutenants, R.N., returning from leave), a Japanese subject, and a Chinese ex-Minister.

A very similar incident, in which prompt action taken by the Commander-in-Chief, China Station, resulted in the rescue of the British ship Tungchow, with 70 school-children on board, from pirates, has recently been fully reported in the newspapers.

In March, 1934, the Wishart went alongside the U.S.S. Fulton, which was on fire at sea, and rescued 139 of her crew, afterwards escorting the hulk to port when it had been taken in tow by another ship.

In October, 1934, the Suffolk was sent to the assistance of the British ship City of Cambridge, which was wrecked on the Pratas Reef in heavy weather. The Suffolk rescued the entire crew of 15 Europeans and 70 Lascars.

In the same month, the Adventure was sent to the assistance of the tug Taikoo, which was in danger of being overtaken by a typhoon, and escorted her safely into port.

Assistance was also given by gunboats when the American ship Jefferson Myers, the Asiatic Petroleum Co.'s ship Wukiang, and the Chinese ship Yung Ling, ran aground.

The Anti-Piracy patrol off the Bias Bay coast has been maintained, and acts as a deterrent to piracy in this area.

HYDROGRAPHY.

It has been decided that the Admiralty shall undertake the construction of a magnetic survey ship, which is urgently required to carry out magnetic observations at sea, and provision for commencing work upon her is made in these Estimates. Without such a vessel, it is impossible to determine the secular change in magnetic variation at sea, and thus to provide accurate forecasts of the correction to be applied to the standard, i.e., the magnetic compass, in all ships.

Up to 1929, these observations were made by a ship belonging to the Carnegie Institution at Washington. Unfortunately, this vessel was destroyed by fire in 1929, and the Institution has decided not to replace her.

It is of special importance to this country, as the principal maritime nation of the world, that a vessel should be built to resume the work with the least possible delay.

During 1934, H.M. Surveying Ships have all been fully employed in making new surveys or re-surveys as necessary, the number of ships employed being four at home and four abroad. Of the latter, one has been employed in the Far East, one on the coast of Siam, one in the Persian Gulf and Cyprus, and one in the West Indies and on the coast of Labrador. The party left in Labrador during the winter of 1933–34 were re-embarked by the Challenger in July last, having accomplished a considerable amount of work. Owing to more urgent requirements, the Labrador survey will not proceed for the present.

The tidal stream survey of the British Isles has been continued in collaboration with the French and Netherlands Governments ; assistance has also been given by the Fishery Board for Scotland and the Northern Lighthouse Board. Satisfactory progress is being made, and data have been collected at some sixty stations during the year.

Further developments are taking place in both deep and shallow echo-sounding apparatus, which continue to give highly satisfactory results. The development of a boat set has enabled echo-sounding methods to be employed by the motor boats of surveying ships, and areas to be surveyed can thus be covered in a much shorter time, since echo-sounding does not, as does the use of the sounding machine or the hand lead, involve the stopping of the boats. The development of visual recorders, which enable a trace to be made of the sea bottom, has also been considerably advanced.

An engraving machine, one of very few in existence, has recently been installed at the Admiralty Chart Establishment, Cricklewood, and is giving satisfactory results.

The publication of Notices to Mariners by the Admiralty for the Fleet and Mercantile Marine, which was inaugurated as a single service on the 1st January, 1934, appears satisfactorily to meet the requirements of seamen.

METEOROLOGY.

Progress has been continued during the year, in collaboration with the Air Ministry, in the development of Fleet Meteorology, the improvement of meteorological instruments for the use of the Fleet Air Arm and H.M. Ships generally, and the collection of meteorological data.

NAVIGATION.

After extensive investigations, H.M. Ships are being equipped with new navigational instruments of much higher efficiency, including Speed and Distance Recorders, Automatic Course Recorders and Echo-Sounding Gear.

The new Regulations for Preventing Collisions at Sea, prescribed by the International Convention for the Safety of Life at Sea, 1929, which include provision for the use of a second navigational steaming light in all ships, still await universal ratification. Meanwhile, in anticipation of the operation of the new Regulations, those of the smaller ships and auxiliaries which were not so fitted as to be able to show a second navigational steaming light are being fitted as necessary, and this work is approaching completion.

FISHERY PROTECTION.

The work of the Fishery Protection and Minesweeping Flotilla in protecting British Fishing interests, assisting the fishing fleets, and training Reserve Officers and men in minesweeping, continues to be carried out.

During the past year the Captain commanding the Fishery Protection and Minesweeping Flotilla visited Norway, Belgium, and Holland, and other units of his command visited ports in Germany, Belgium, Holland, Norway, Denmark, Iceland, and the Faroe Islands.

CO-OPERATION BETWEEN THE SERVICES.

The necessity for close co-operation between the three Defence Services is constantly in mind. The Chiefs of Staff are in frequent consultation, and no effort is spared to establish that close liaison between the personnel, and that common doctrine on matters of joint concern, which are essential for the most efficient collaboration.

The principle of co-operation is also fostered at the Imperial Defence College, where senior officers from the three Services meet as students. It forms, too, one of the most important parts of the teaching at the Naval Staff College. During the year spent at the Staff College, the younger officers are brought into the closest touch with the students at Camberley and Andover.

Valuable experience is also gained by combined exercises, such as the exercise carried out off the Yorkshire Coast last September. This was designed to test the general arrangements for inter-communication between the three Services during a combined operation. Other exercises included air attacks on the Home Fleet while on passage through the Straits of Dover and the English Channel.

NAVAL AIR WORK.

The fitting of Aircraft Carriers with arresting and accelerating gear, by means of which the taking-off and landing-on of aircraft are made less dependent upon the Carrier's speed and course in relation to the wind, is being continued. Considerable economy in fuel and in wear and tear of machinery in the Carriers is being effected by these improvements, and, in addition, greater flying efficiency is attained.

Twenty-six Capital Ships and Cruisers are now fitted with catapults and 33 Aircraft are allocated to them. H.M.S. Nelson, though not yet fitted with a catapult, carries one of the new small amphibian flying boats, which can be hoisted in and out by a crane, and with which it is hoped to gain valuable experience of reconnaissance work and rough sea operation.

The gradual equipment of the Fleet with Aircraft up to its present full capacity is being continued. The replacement of the older types of T/B and S/R aircraft will be completed during the current year; in some instances these types are being replaced by the new T.S.R. type, which combines the functions of both in a single aircraft.

The numbers of Pilots and Observers taken for training annually are being increased from 24 and 12 to 34 and 18 respectively, in order to meet the requirements of the present expansion of the Fleet Air Arm.

FLEET TRAINING.

The return of the Home Fleet from its West Indian cruise early in March, 1934, presented a favourable opportunity, with the requisite setting, for a full-scale combined Fleet exercise in the Atlantic between the Home and Mediterranean Fleets. The exercise, which was carried out under most adverse weather conditions, proved of the greatest value. A somewhat similar exercise is being carried out this year on the return of the Home Fleet from its West Indian Cruise. This year, however, arrangements have been made with the Board of Trade for the co-operation of those ships of the Merchant Navy which would normally be passing through the area of the exercise. It is hoped that the inclusion of these ships will give additional realism to the exercise, which will provide valuable training and insight into the problem of the protection of our sea communications.

PERSONNEL.

The recommendations made in the report of the Warren Fisher Committee on the Medical Services of the Defence Forces have, in the main, been applied to the Naval Medical Service. They have had a satisfactory reception in the various Universities and Teaching Colleges, and applicants for Commissions, since the publication of the new regulations, have been satisfactory in both quality and number. It is hoped that the difficulties in recruiting for the Naval Medical Service have now been overcome.

Among the recommendations adopted is the establishment of annual medical scholarships in connection with the Lord Kitchener National Memorial Fund to assist the sons of parents in the service of the Crown to enter the medical branches of the Defence Services.

It has been recognised for some time that the rates of pay for Chaplains have been inadequate, particularly in the early years, under the special conditions of naval service. It has been found possible to grant an improvement in the scale of pay which should alleviate the position.

During the year the Admiralty have obtained reports from the Fleet on the comparative merits of Midshipmen who were trained as Cadets in the R.N. College, Dartmouth, and those who were entered at a later age as Special Entry Cadets. The reports tend strongly to the view that the present system of dual entry is the best, and therefore both sources of entry will continue to be used, in the existing proportions. The position will continue to be reviewed at intervals in the light of further experience.

Arrangements have been made with certain of the principal Universities for the nomination of graduates for commissions in the Royal Marines. A limited number of commissions will be offered annually to such candidates.

The opportunity of attaining warrant rank has now been extended to Continuous Service Officers' Stewards, and to Continuous Service Officers' Cooks (old system).

Advancement in substantive and non-substantive ratings is at present rapid owing to the large numbers of men, recruited in the years immediately preceding the war, who are now completing time for pension, and whose places must be filled. It is a long time since the advancement prospects of the Lower Deck have been so good.

Although new entries are being recruited in large numbers, both through the normal training establishments and for short service, to meet this abnormal wastage of time-expired men, the standard of the recruits is being satisfactorily maintained. In order to carry out the training of the large number of young ratings now being drafted to the service afloat without loss of efficiency to the ships concerned, it has been found necessary slightly to modify the normal cruise programme of the Home Fleet, and this, together with the alterations necessitated by the celebration of the Twenty-fifth Anniversary of His Majesty's Accession, will involve a considerable curtailment of the customary visits of H.M. Ships to coastal resorts during the summer months of this year.

MATERIAL. NEW CONSTRUCTION.

AIRCRAFT CARRIER.

1934 *Programme.*

Tenders for the Aircraft Carrier of the 1934 Programme, which is to be named the Ark Royal, are now under consideration, and the order will be placed shortly.

CRUISERS.

1931 *Programme.*

The Ajax, a vessel of the "Leander" Class, which is being built by Messrs. Vickers-Armstrongs, Limited, at Barrow-in-Furness, was launched on March 1, 1934, and is due for completion early in the financial year 1935.

The Amphion, the first of the modified "Leander" Class, was launched at Portsmouth on July 27, 1934. The construction of the ship is proceeding satisfactorily, and she is due for completion in the summer of 1935.

The Arethusa, the first of the class of smaller cruisers of about 5,200 tons, was launched at Chatham on March 6, 1934. Construction is proceeding satisfactorily, and the vessel is due for completion early in the financial year 1935.

1932 *Programme.*

The Apollo, a Cruiser of the modified "Leander" Class, was launched at Devonport on October 9, 1934. The construction of the vessel is proceeding satisfactorily, with a view to completion in the late autumn of 1935.

The Galatea, the second ship of the "Arethusa" type, which is under construction by Messrs. Scott's Shipbuilding and Engineering Company, Limited, Greenock, was launched on August 9, 1934. Work is proceeding normally, with a view to completion in the summer of 1935.

The Sydney (late Phaeton) of the modified "Leander" Class, which is being built by Messrs. Swan, Hunter and Wigham Richardson, Limited, at Wallsend-on-Tyne, and which has been taken over by the Commonwealth of Australia, was launched on September 22, 1934, and is due for completion in the late summer of 1935.

1933 *Programme.*

The Southampton (late Polyphemus) was laid down by Messrs. John Brown and Company, Limited, Clydebank, on November 21, 1934, and will probably be launched in February, 1936. The Newcastle (late Minotaur) was laid down by Messrs. Vickers-Armstrongs, Limited, Walker-on-Tyne, on October 4, 1934, and will probably be launched in January, 1936. These vessels are the first of the new 9,000-ton type.

The Penelope, the third ship of the "Arethusa" Class, was laid down at the works of Messrs. Harland and Wolff, Limited, Belfast, on May 30, 1934, and will probably be launched in October, 1935.

1934 *Programme.*

Orders were placed on December 17, 1934, for two further Cruisers of the " Southampton " Class (late " Minotaur " Class); the Sheffield with Messrs. Vickers-Armstrongs, Limited, Walker-on-Tyne, and the Glasgow with Messrs. Scott's Shipbuilding and Engineering Company, Limited, Greenock. The keel of the Sheffield was laid on January 31, 1935.

The Birmingham, the fifth Cruiser of the " Southampton " Class, is to be built at Devonport Dockyard, and the Aurora, the fourth ship of the " Arethusa " Class, at Portsmouth. Orders have been given for their construction to be commenced.

LEADERS AND DESTROYERS.

1931 *Programme.*

The Flotilla Leader Exmouth and the eight Destroyers of the " Eclipse " Class have been completed and have passed into service during the present financial year.

1932 *Programme.*

The Flotilla Leader Faulknor and six of the eight Destroyers of the " Fearless " Class will, it is anticipated, be completed at an early date in the financial year 1935. The Fearless herself was completed in December, 1934, and the Forester is due for completion before the end of the present financial year.

1933 *Programme.*

The construction of the Flotilla Leader Grenville and the eight Destroyers of the " Greyhound " Class ordered in March, 1934, is proceeding satisfactorily. The Grenville will probably be completed early in the financial year 1936 and the Destroyers before the end of the financial year 1935.

1934 *Programme.*

An order for the construction of the Flotilla Leader Hardy was placed on December 12, 1934, with Messrs. Cammell Laird and Company, Limited, Birkenhead, and on December 13 orders for eight Destroyers were placed as follows :—

Hero and Hereward .	Messrs. Parsons Marine Steam Turbine Company, Limited, Wallsend-on-Tyne. (Hulls by Messrs. Vickers-Armstrongs, Limited, Walker-on-Tyne.)
Hasty and Havock .	Messrs. Denny and Brothers, Limited, Dumbarton.
Hostile and Hotspur .	Messrs. Scott's Shipbuilding and Engineering Company, Limited, Greenock.
Hunter and Hyperion .	Messrs. Swan, Hunter, and Wigham Richardson, Limited, Wallsend-on-Tyne.

These vessels should be completed about December, 1936.

SUBMARINES.

1931 *Programme.*

The Severn, a sister vessel to the Thames, was completed at the works of Messrs. Vickers-Armstrongs, Limited, Barrow-in-Furness, on January 12, 1935. The Shark, of the " Swordfish " Class, was completed at Chatham Dockyard on December 31, 1934, and has passed into service. The Sealion, a sister vessel of the Shark, was completed at the works of Messrs. Cammell Laird and Company, Limited, Birkenhead, on December 21, 1934, and this vessel also has passed into service.

1932 *Programme.*

The Clyde, of the " Thames " Class, will be completed shortly at the works of Messrs. Vickers-Armstrongs, Limited, Barrow-in-Furness. The Salmon, under construction at the works of Messrs. Cammell Laird and Company, Limited, Birkenhead, and the Snapper, at Chatham Dockyard, both of the " Swordfish " Class, are due for completion in March and June, 1935, respectively.

1933 *Programme.*

The minelayer submarine Grampus, ordered in March, 1934, to be built at Chatham Dockyard, was laid down on August 20, 1934, and is due for completion in the summer of 1936.

A sister vessel, the Narwhal, which is being built by Messrs. Vickers-Armstrongs, Limited, Barrow-in-Furness, was laid down on May 29, 1934, and is due for completion in March, 1936.

The Seawolf, of the "Swordfish" Class, which is being built by Messrs. Scott's Shipbuilding and Engineering Company, Limited, will be launched in October, 1935, and is due for completion in March, 1936.

1934 *Programme.*

A minelayer submarine, the Rorqual, was ordered from Messrs. Vickers-Armstrongs, Limited, Barrow-in-Furness, on February 15, 1935.

The Spearfish, of the "Swordfish" Class, was ordered from Messrs. Cammell Laird and Company, Limited, Birkenhead, on the 18th of the same month, and orders have been given for the construction of the Sunfish, also of this class, to be commenced at Chatham Dockyard on March 1, 1935.

SLOOPS.

The two sloops Grimsby and Leith of the 1931 Programme and the two sloops Lowestoft and Wellington of the 1932 Programme were completed at Devonport during the present financial year. The two sloops of the 1933 Programme, the Londonderry and Deptford, which are being built at Devonport and Chatham respectively and were launched on January 16 and February 5, 1935, will probably be completed by the autumn of 1935. Orders have been given for the construction of two sloops of the 1934 Programme, the Fleetwood and Aberdeen, at Devonport Dockyard, to be commenced on March 1, 1935.

The two sloop minesweepers, the Halcyon and Skipjack, of the 1931 Programme, and the two similar vessels of the 1932 programme, the Harrier and Hussar, were completed in the present financial year. The sloop minesweeper of the 1933 Programme, the Speedwell, under construction by Messrs. W. Hamilton and Company, Limited, Port Glasgow, will be launched shortly, and will probably be completed in the late summer of 1935. The orders for the two similar vessels of the 1934 Programme, the Niger and Salamander, were placed on February 5, 1935, with Messrs. J. S. White and Company, Limited, East Cowes.

As has been mentioned earlier in this Statement, the convoy sloop of the 1933 Programme, the Bittern, which is being built by Messrs. John Brown and Company, Limited, Clydebank, has been renamed the Enchantress. She was launched on December 21, 1934, and will be completed early in the financial year 1935.

The coastal sloop of the 1933 Programme, the Kingfisher, was launched at the works of Messrs. The Fairfield Shipbuilding and Engineering Company, Limited, Govan, on February 14, 1935, and should be completed in June, 1935. Orders for the two coastal sloops of the 1934 Programme, the Puffin and Mallard, are about to be placed with Messrs. Alexander Stephen and Sons, Limited, Govan.

The sloop Indus, which is being built by Messrs. Hawthorn Leslie and Company, Limited, Hebburn-on-Tyne, for the Royal Indian Navy, is due for completion this month.

DEPOT SHIP FOR DESTROYER FLOTILLAS.

The Woolwich (1932 Programme) was launched on September 20, 1934, and will, it is anticipated, be completed in the summer of 1935.

OTHER VESSELS.

The order for the Protector, Netlayer and Target Towing Vessel of the 1934 Programme, is about to be placed with Messrs. Yarrow and Company, Limited, Scotstoun, and the order for the Stork, Surveying Ship of the same Programme, will be placed shortly.

The Aldgate and Watergate, Boom Gate Vessels, of the 1932 and 1933 Programmes respectively, have been completed. Orders for the similar vessels of the 1934 Programme, the Dowgate and Ludgate, have recently been placed with the Hong Kong and Whampoa Dock Company.

The Dunnet, Boom Working Vessel of the 1934 Programme, will be ordered shortly.

A vessel of the "Trawler" type, named the Basset (1934 Programme), was ordered from Messrs. Henry Robb, Limited, Leith, on November 27, 1934.

The trawler Earl Haig has been purchased for use as a Boom Working Vessel, and renamed the Barnet.

NAVAL WORKS.

The principal new works for which provision is made comprise further storage accommodation for oil fuel, improved storage at two Naval Armament Depots, and the reconstruction of a portion of one of the Ship Shops at Portsmouth Dockyard.

The western portion of this Shop was originally erected at Haslar Hospital in 1854, for use in the Crimean War. It was re-erected on its present site, and adapted for use as a workshop, in 1869, and is now badly in need of reconstruction on modern lines.

Work upon the Naval Base at Singapore continues to proceed satisfactorily.

The Jackson contract is due for completion on September 28, 1935, the Graving Dock should be ready for use in September, 1937, and the Base should be completed towards the end of the financial year 1939.

Payment of the Admiralty's share of the generous contributions towards the cost of the Base made by the Governments of Hong Kong, the Federated Malay States, and New Zealand, will be completed by the receipt of the final contribution of £72,000 from the New Zealand Government allowed for in these Estimates.

MISCELLANEOUS.

The work of fitting submarines with special appliances to facilitate escape by use of the Davis Submerged Escape Apparatus has been completed, and all existing submarines are now fully equipped. New submarines will be equipped during construction.

All officers and men, on first joining submarines, are fully trained in the use of the apparatus in the Training Tank at Fort Blockhouse, Gosport, and are given requalifying courses either at home or in Tanks abroad at frequent intervals.

A Training Tank at Hong Kong was completed in 1934 and is now in use, and one at Malta will be ready about the middle of this year.

The replacement of the Metropolitan Police by the Royal Marine Police in H.M. Dockyards and other Admiralty Establishments was completed in August last, when the Royal Marine Police took over the duty of policing Devonport Dockyard. The field of recruitment for the Royal Marine Police has now been extended to pensioner ratings of certain branches of the Royal Navy.

The new procedure for controlling the administration of naval stores on board H.M. Ships, which substitutes a basis of financial limitation for one of scale allowance of individual items of stores, is now generally established throughout the Fleet. This reform is estimated to have brought about an economy in excess of £1,500,000 over a period of about twelve years.

The numerous modern developments in steam-generating plant are being kept under observation and are being utilised so far as is possible ; a steam generator of the "Velox" type is on order for trial, and experimental work on the standard type of boiler has been continued with satisfactory results at the Admiralty Fuel Experimental Station.

Trials and tests of various fuels and oil-burning apparatus also continue, these including burning tests of fuel oils produced from coal ; any such oils found to be suitable as boiler fuel will continue to be utilised for service afloat.

Steady progress has been made at the Admiralty Engineering Laboratory in the development of high speed and other compression ignition engines for use in the Naval Service. Increasing use is being made of the fast running heavy-oil engine both for boats and for auxiliary services on board H.M. ships.

In addition, close touch is being maintained both at home and abroad with the numerous developments which are taking place in the engineering industry, and arrangements have been concluded for several advanced designs to be made available for Admiralty investigation.

ABSTRACT OF NAVY ESTIMATES FOR 1935.

Votes.		Estimates 1935.		Estimates 1934.
		Gross Estimate.	Net Estimate.	Net Estimate.
	I.—NUMBERS.		Maximum Numbers.	Maximum Numbers.
A	Number of Officers, Seamen, Boys, and Royal Marines	94,482	94,482	92,338
	Number of Royal Marine Police	888	888	884
	II.—EFFECTIVE SERVICES.	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services	12,940,200	12,868,000	12,633,000
2	Victualling and Clothing for the Navy	3,904,985	3,281,400	3,165,700
3	Medical Establishments and Services	446,240	376,200	366,200
4	Fleet Air Arm	1,873,000	1,873,000	1,338,000
5	Educational Services	259,460	195,100	195,800
6	Scientific Services	537,220	474,000	461,500
7	Royal Naval Reserves	350,690	350,500	348,000
8	Shipbuilding, Repairs, Maintenance, etc.:			
	Section I.—*Personnel*	6,867,090	6,806,500	6,426,000
	Section II.—*Matériel*	5,384,400	4,827,200	4,844,000
	Section III.—Contract Work	11,296,200	10,723,600	9,407,500
9	Naval Armaments	5,186,500	4,800,000	4,053,200
10	Works, Buildings, and Repairs at Home and Abroad	2,418,950	2,209,750	2,277,000
11	Miscellaneous Effective Services	689,000	626,750	603,300
12	Admiralty Office	1,140,291	1,130,000	1,089,000
	Total Effective Services £	53,294,246	50,542,000	47,208,200
	III.—NON-EFFECTIVE SERVICES.			
13	Naval and Marine, Officers	3,216,021	3,200,000	3,190,000
14	Naval and Marine, Men	5,231,550	5,137,000	5,044,000
15	Civil Superannuation, Compensation Allowances, and Gratuities	1,173,563	1,171,000	1,107,800
	Total Non-Effective Services £	9,621,134	9,508,000	9,341,800
	GRAND TOTAL £	62,915,380	60,050,000	56,550,000

NET INCREASE . . . . . £3,500,000.

ADMIRALTY,
18 *Feb.*, 1935

B. EYRES MONSELL,
ERNLE CHATFIELD,
DUDLEY POUND,

R. G. H. HENDERSON,
PERCY NOBLE,
C. J. C. LITTLE,

STANLEY,
EUAN WALLACE,
O. MURRAY.

STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1917 TO 1933, AND THE ESTIMATES FOR 1934 AND 1935.

YEAR	VOTE A. — Average numbers borne. (a)	VOTE 1. — Wages, &c., of Officers, &c	VOTE 2. — Victualling and Clothing.	VOTE 3. — Medical Establishments, &c.	VOTE 4. — Civilians employed on Fleet Services.	VOTE 5. — Educational Services.	VOTE 6. — Scientific Services.	VOTE 7. — Royal Naval Reserves	VOTE 8. — Shipbuilding, Repairs, Maintenance, &c.			VOTE 9. — Naval Armaments.	VOTE 10. — Works.	VOTE 11. — Miscellaneous.	VOTE 12. — Admiralty Office.	VOTE 13. — Half Pay, &c.	VOTE 14. — Naval, &c., Pensions.	VOTE 15. — Civil Superannuation, &c.	Balances Irrecoverable.	Total Expenditure
									Section I. Personnel.	Section II. Matériel.	Section III. Contract Work.									
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1917	406,977	37,559,536	13,481,159	792,569	561,308	210,243	152,160	874,930	12,660,160	36,494,694	70,609,055	34,177,359	6,556,799	9,193,802	1,454,835	709,227	1,446,247	413,746	41,092	227,383,891
1918	381,311	46,373,511	24,219,351	1,158,287	491,270	247,922	262,886	871,970	15,037,763	59,128,675	94,248,874	64,866,784	10,928,241	9,357,532	1,985,894	704,914	8,733,778	445,485	28,090	334,091,227
1919	176,087	32,385,306	8,823,106	733,046	556,778	401,864	364,832	458,044	12,426,177	*Credit :— 785,986*	48,348,933	14,441,835	5,595,608	11,118,631	2,042,715	1,176,937	15,133,064	802,279	60,875	154,084,044
1920	124,009	21,314,360	8,311,708	683,830	759,110	503,152	249,185	359,694	12,096,747	6,799,965	12,001,445	8,498,951	4,992,969	5,724,974	2,073,764	2,352,344	4,847,475	880,996	23,611	92,505,290
1921	127,180	19,220,859	6,831,481	643,735	480,243	405,592	359,575	423,056	10,690,188	8,835,771	4,834,836	6,253,468	4,746,485	3,506,514	1,780,641	2,002,201	3,881,368	1,020,693	69,935	75,986,141
																Non-effective Services.				
																Officers.	Men.			
1922	107,782	15,762,232	4,767,118	492,419	258,600	382,065	354,961	423,722	7,075,533	3,877,716	3,225,598	3,678,783	3,553,831	2,096,219	1,871,961	3,701,984	5,471,088	968,880	29,679	57,492,389
1923	99,107	14,175,111	4,153,803	410,842	193,793	330,644	379,489	459,391	6,751,496	5,521,336	4,427,874	3,840,606	3,215,766	982,173	1,247,813	2,856,764	4,260,245	823,340	33,864	54,064,350
1924	99,453	14,150,863	4,152,902	442,756	190,669 Fleet Air Arm (b)	334,648	393,054	446,902	7,489,659	5,592,183	5,415,210	3,507,190	3,140,887	1,065,869	1,349,519	2,868,798	4,328,526	811,797	12,355	55,693,787
1925	100,284	14,576,499	4,226,570	440,209	1,320,000	327,226	417,552	465,114	7,929,259	6,905,184	6,395,406	4,247,113	2,422,050	826,119	1,307,790	2,812,336	4,449,585	928,326	8,110	60,004,548
1926	100,791	14,322,678	4,236,846	434,919	681,000	324,036	393,339	444,759	7,487,952	5,422,141	7,275,173	3,595,037	2,108,441	930,369	1,203,639	2,914,419	4,450,140	894,472	23,002	57,142,862
1927	101,916	14,508,462	4,182,491	423,777	882,000	224,334	402,976	419,086	7,067,419	4,678,052	8,839,423	3,996,749	1,900,788	844,852	1,233,132	2,966,485	4,525,353	965,602	2,276	58,123,257
1928	100,680	14,435,347	3,992,639	418,863	1,008,300	226,486	396,298	403,295	6,743,571	5,074,290	8,263,060	3,871,235	1,950,207	728,841	1,181,125	3,006,321	4,496,310	944,735	4,223	57,139,146
1929	99,300	14,286,313	3,840,098	419,371	1,066,000	226,449	467,343	387,241	6,561,827	4,977,230	7,291,217	3,868,359	2,079,775	725,511	1,194,842	3,075,856	4,550,155	968,944	1,239	55,987,770
1930	94,921	13,996,225	3,531,280	394,505	1,267,000	224,722	470,965	395,648	6,227,647	4,198,553	5,532,728	3,557,624	1,928,639	667,107	1,178,675	3,121,672	4,592,970	983,198	5,033	52,274,186
1931	92,449	13,432,777	3,145,731	379,239	1,126,000	219,367	451,498	394,007	6,331,341	4,517,054	4,717,751	3,326,274	2,399,570	683,774	1,114,266	3,123,312	4,625,833	1,026,306	652	51,014,752
1932	89,667	12,636,077	2,980,931	361,229	1,025,000	207,442	453,149	346,552	6,262,431	4,190,785	5,429,049	3,318,886	2,374,150	562,029	1,086,182	3,125,419	4,741,854	1,060,833	2,455	50,164,458
1933	89,863	12,514,488	3,182,430	376,228	1,089,000	194,742	454,819	378,092	6,192,587	4,851,666	7,905,227	3,767,355	2,243,564	572,722	1,079,214	3,231,172	4,857,822	1,055,710	1,707	53,443,545
1934 (estimate)	92,338(b)	12,633,000	3,165,700	366,200	1,338,000	195,800	461,500	348,000	6,426,000	4,844,000	9,407,500	4,053,200	2,277,000	603,300	1,089,000	3,190,000	5,044,000	1,107,800	—	56,550,000
1935 (estimate)	94,482(b)	12,868,000	3,281,400	376,200	1,873,000	195,100	474,000	350,500	6,806,500	4,827,200	10,723,600	4,800,000	2,209,750	626,750	1,130,000	3,200,000	5,137,000	1,171,000	—	60,050,000

Note.—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Accounts as receipts in excess of estimated Appropriations in Aid.

(a) Exclusive of Royal Marine Police.

(b) Maximum for the year.

STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1936.

The Estimates which I now present make provision for the ordinary maintenance, repairs, and ancillary services of the Fleet, for progress with new construction already authorised, for proceeding with the modernisation of existing capital ships and the re-equipment of the Fleet Air Arm in accordance with announcements already made, and for expenditure on repairing deficiencies included in the programme referred to in the White Paper laid before Parliament in March, 1935, Cmd. 4827, with certain additions that have been approved as part of the special measures taken in connection with the Italo-Ethiopian dispute.

No provision has been made in these Estimates for the additional expenditure which will result from the further proposals for making good defence deficiencies which have recently been under consideration by H.M. Government, and which are referred to in the White Paper to be issued in connection with the forthcoming debate on defence policy. Likewise, no provision is made in these Estimates for the 1936 New Construction programme, which can best be presented in connection with these further proposals.

Provision for expenditure in the ensuing financial year on the 1936 New Construction programme and on other items resulting from the new proposals for making good defence deficiencies will be made in the Supplementary Estimates to be presented to Parliament at a later date.

On this basis, the net total of the Navy Estimates for 1936 is £69,930,000 and exceeds by £9,880,000 the net total of the Navy Estimates for 1935 excluding the Supplementary Estimate of £4,850,000.

Of the increase of £9,880,000, £4,645,109 is required in order to make progress with New Construction already authorised. This addition is required partly because the Programmes of 1934 and 1935 were larger than those of preceding years, and partly because the destroyers of the 1935 Programme were laid down earlier, and the construction of the cruisers of the 1933 and 1934 Programmes is proceeding more rapidly than was originally anticipated.

There is an increase of £1,082,000 in the expenditure on the Fleet Air Arm, excluding the cost of aircraft for new ships, which is included under the heading of New Construction. This increase is required mainly for re-equipment and maintenance of the existing Flights of the Fleet Air Arm.

There is also an increase of £3,936,191 in the provision for the Maintenance of the Fleet, the most considerable items under this heading being increased provision for repairs and refits and for strengthening the defence of the Fleet against air attack, and increased provision on the basis already mentioned for making good deficiencies in defensive material, stores, and equipment.

Lastly, there is an increase of £216,700 under the Non-Effective Votes, which is automatic.

Provision is made in Vote A for an increase of 4,613 in the personnel of the Fleet. This increase includes the additional personnel provided by the Supplementary Estimate for 1935 and necessitated by the present Fleet dispositions.

As in previous years, allowance has been made for anticipated under-spending in Contract work, etc.

MONSELL.

ADMIRALTY,
2nd March, 1936.

NOTES ON MATTERS OF GENERAL INTEREST.

TWENTY-FIFTH ANNIVERSARY OF THE ACCESSION OF HIS LATE MAJESTY KING GEORGE V.

His late Majesty King George V reviewed the combined Mediterranean, Home and Reserve Fleets at Spithead on the 16th July, and on the following day, in His Majesty's Yacht Victoria and Albert, led the Fleets to sea for gunnery exercises and manœuvres.

At the time of the Jubilee Celebrations, His Royal Highness the Duke of Gloucester proceeded to Belfast in the Achilles; the Neptune was present at Cardiff during the visit of His Majesty King Edward VIII, then Prince of Wales; and the Valiant represented the Home Fleet when His Royal Highness the Duke of York visited Edinburgh.

His Majesty King Edward VIII, as Prince of Wales, proceeded to the Channel Islands at the end of July in the Flotilla Leader Faulknor. The Fury acted as escort.

In order to provide an opportunity for the citizens of London to visit ships of the Fleet, certain units of the Home Fleet visited Southend and the River Thames during May.

ANGLO-GERMAN NAVAL AGREEMENT.

In June, 1935, H.M. Government concluded an agreement with the German Government, whereby the strength of the German Fleet was permanently fixed at 35 per cent. of the aggregate naval strength of the members of the British Commonwealth of Nations.

At the same time the German Government recognised the principle of limitation by categories and agreed to calculate their 35 per cent. by this method.

LONDON NAVAL CONFERENCE, 1935.

The London Naval Conference 1935 met on 9th December, 1935. Although Japan withdrew from the Conference on 15th January, 1936, because her proposal for a " common upper limit " received no support from other Powers, it is hoped to reach an agreement between the other parties to the Conference on qualitative limitation, advance notification of naval construction, and exchange of information, and also on the minor provisions of the Washington and London Naval Treaties, which may eventually be accepted by all the naval powers of the world.

DISTRIBUTION OF THE FLEET.

Apart from the temporary detachment of vessels to the Mediterranean and Red Sea, the principal changes made or to be made in the distribution of the Fleet are the following :—

BATTLESHIPS AND BATTLE CRUISERS.

In accordance with the decision, announced a year ago, to redistribute the Capital Ships in the Home and Mediterranean Fleets, the Ramillies and the Valiant exchanged crews after the Review, the former joining the Home Fleet and the latter the Mediterranean Fleet.

Similarly at the end of August the Barham on recommissioning proceeded to the Mediterranean, and the Royal Sovereign recommissioned for service in the Home Fleet.

The Revenge has returned home from the Mediterranean and will commence her large repairs in September. The Resolution also has returned to Home Waters.

The Repulse, on completing large repairs in May, will proceed to the Mediterranean, and the Renown will subsequently be taken in hand for large repairs and modernisation.

AIRCRAFT CARRIERS.

The Furious is being employed for Home Fleet training work and for co-operation with the shore bases in the training of new pilots.

CRUISERS.

Home Station.

The Southampton and the Newcastle (1933 Programme) will join the 2nd Cruiser Squadron on completion early in 1937.

Mediterranean Station.

The Despatch replaced the Coventry as flagship of the Mediterranean Destroyer Flotillas in May, 1935. The Arethusa and the Galatea joined the 3rd Cruiser Squadron in August and September, 1935, respectively. The Galatea has been temporarily detached for service with the Mediterranean Destroyer Flotillas, and her place in the 3rd Cruiser Squadron has been taken by the Despatch.

China Station.

The Cornwall and the Kent will return to England in July and December, 1936, respectively, to undergo large repairs.

The Dorsetshire will return home early in 1937 to refit and recommission.

On completion, all the above ships will return to the China Station; in the meantime a Cruiser will be sent from Home Waters for service in the China Squadron, leaving in September, 1936.

East Indies Station.

The Norfolk relieved the Hawkins as flagship on the East Indies Station in May. The Hawkins has returned home and has been placed in Reserve.

The Colombo returned to England at the end of November, having been temporarily relieved by the Diomede, from the New Zealand Station. She has now joined the Reserve Fleet.

The Enterprise completed large repairs in January, 1936, and is returning to the East Indies Station.

America and West Indies Station.

The Danae, on the completion of her commission, returned to England in November. She has been relieved by the Apollo (1932 Programme).

The Dragon arrived home in August to recommission, returning to her station the same month.

The Exeter and York are due to return home in May and September respectively to refit and recommission, after which they will rejoin their station for further service.

Africa Station.

The Amphion, which has been delayed during trials, is expected to complete about the end of July, 1936. She is then due to join the Africa Station to take over the flag from the Carlisle.

LEADERS AND DESTROYERS.

The vessels of the 1933 Programme, viz. the Leader Grenville and eight Destroyers of the "Greyhound" Class, will all have entered service by April. In the first instance they will relieve vessels of war-time construction in the Home Fleet; later, it is intended that they shall proceed to the Mediterranean and there replace older vessels.

The vessels of the 1934 Programme, viz. the Leader Hardy and eight Destroyers of the "Hero" Class, will on completion relieve older vessels in the Home Fleet.

SUBMARINES.

The submarine Snapper, of the 1932 Programme, has joined the newly constituted 3rd Submarine Flotilla.

It is intended that the Narwhal and Seawolf, of the 1933 Programme, shall shortly join the 3rd and 5th Submarine Flotillas, respectively.

SLOOPS.

The new Sloops Londonderry and Deptford have replaced older Sloops abroad.

The new Sloop Aberdeen (1934 Programme) will replace the Bryony in the Mediterranean in the course of this year. The new Sloop Fleetwood (1934 Programme) will carry out special trials for 18 months after completion.

The Hastings (which went aground on Shabkutb Reef in the Red Sea in June and was refloated with difficulty) will, on completion of repairs, replace the Harebell on Fishery Protection duties.

The Lupin will replace the Godetia on Fishery Protection duties about March, 1936.

The Penzance recommissioned in November, 1935, for service on the Africa Station, but has been temporarily retained in the Red Sea.

The Speedwell (1933 Programme) has joined the 1st Minesweeping Flotilla, and the Niger and Salamander (1934 Programme) will also join that flotilla on completion in the middle of this year.

CONVOY AND COASTAL SLOOPS.

The first Convoy Sloop, the Enchantress, completed in April, 1935, and was used by the Board of Admiralty in place of an Admiralty Yacht during the Review. After the Review she commenced a series of trials which are not yet complete.

The Kingfisher, first of the Coastal Sloops, has joined the 1st Anti-Submarine Flotilla for extensive trials, on completion of which she is to relieve P.40 in that flotilla.

The Mallard and the Puffin are due to complete during the year. The former will relieve the Spey in the Fishery Protection Flotilla and the latter a vessel of the 1st Anti-Submarine Flotilla.

SURVEYING SHIP.

The new surveying ship Stork will, on completion in the autumn of 1936, replace the Ormonde.

CO-OPERATION WITH THE DOMINIONS, ETC.

COMMONWEALTH OF AUSTRALIA.

With the concurrence of the Commonwealth Government, the Sussex, which had replaced H.M.A.S. Australia in Australian waters in pursuance of the policy of periodical interchange of R.N. and R.A.N. Cruisers, temporarily rejoined the 1st Cruiser Squadron in the Mediterranean in September, 1935. The Commonwealth Government also agreed that H.M.A.S. Sydney should be temporarily attached to the 2nd Cruiser Squadron at Gibraltar. The consent of the Commonwealth Government to these arrangements has been greatly appreciated by the Admiralty.

H.M.A.S. Brisbane was sent to England in the summer to be prepared for sale, her crew transferring to the Sydney. On her way the Brisbane rendered assistance to the Hastings, then aground in the Red Sea.

DOMINION OF NEW ZEALAND.

The Diomede, with the concurrence of the Government of New Zealand, has proceeded to Aden, where she is now under the orders of the Commander-in-Chief, East Indies Station. The co-operation of the New Zealand Government in this matter has been of great assistance.

The new Sloop Wellington has replaced the older Laburnum in New Zealand waters, and the latter has become the drill ship for the local R.N.V.R. at Singapore.

Arrangements have been concluded with the New Zealand Government for the relief of the Diomede and the Dunedin on the New Zealand Station by two more modern Cruisers, and the Achilles and the Leander have been selected. The Achilles will relieve the Diomede early in the financial year 1936.

INDIAN EMPIRE.

The new Sloop Indus, which was completed in England in March, 1935, was attached to the 1st Minesweeping Flotilla for instruction and subsequently represented the Royal Indian Navy at the Review, after which she proceeded to India.

FLEET ACTIVITIES ABROAD.

MEDITERRANEAN.

Admiral Sir William Fisher, G.C.B., G.C.V.O., the Commander-in-Chief, Mediterranean Fleet, proceeded to Toulon in his flagship Queen Elizabeth in April, in order to return the visit of the French Commander-in-Chief, Vice-Admiral Mouget, to Malta.

Vessels of the 1st Battle Squadron, 1st Cruiser Squadron, 3rd and 4th Destroyer Flotillas and 1st Submarine Flotilla, returned home in June in order to take part in the Review.

Other ships of the Mediterranean Fleet were present at the Jubilee celebrations held at Gibraltar, Malta, Cyprus, and Haifa in May.

The Wishart and the Whitehall, of the 1st Destroyer Flotilla, represented the United Kingdom during the "Grande Semaine Motonautique at Cannes," where a special race meeting had been organised in honour of the Jubilee of His late Majesty King George V. His Majesty King Edward VIII, as Prince of Wales, was present at Cannes on this occasion.

France and Italy were also represented by Destroyers.

PERSIAN GULF.

Our treaty obligations with the Arab Sheiks have been upheld by the Sloops in the Persian Gulf. The usual anti-slavery and gun-running patrols have been carried out.

RED SEA.

The usual anti-slavery patrols have been carried out in the Red Sea.

AMERICA AND WEST INDIES.

The Exeter visited Callao in January, 1935, in connection with the celebrations of the Fourth Centenary of the City of Lima.

The Danae visited Puerto Barios, Guatemala, in February, 1935, in connection with the anniversary of the President's inauguration.

The Danae also proceeded to the Cayman Islands to give assistance following the hurricane which struck the Islands in September.

Vice-Admiral The Hon. Sir Matthew Best, K.C.B., D.S.O., M.V.O., the Commander-in-Chief, America and West Indies Squadron, visited Washington in the autumn of 1935.

CHINA.

Admiral Sir Frederic Dreyer, K.C.B., C.B.E., the Commander-in-Chief of the China Station, visited Japan in the spring of 1935 in his flagship Kent, with other ships of his command. Ships of the China Fleet also visited Japan in the autumn of 1935.

H.M. Ships have been stationed throughout the year at coast and river ports in order to safeguard British interests.

A request having been received from the Chinese authorities for assistance in the conveyance of the Chinese art treasures from China for the Exhibition at the Royal Academy, the Suffolk, on returning to England to refit, carried safely the whole of the Chinese Government's exhibits.

HYDROGRAPHY.

During 1935 H.M. Surveying Ships have all been employed in making new surveys or re-surveys as necessary, the number of ships so engaged being four at home and four abroad. Of the latter, one has been employed in the Far East, one on the Coast of Siam, one in the Persian Gulf and Cyprus, and one in the West Indies.

The tidal stream survey of the British Isles has been continued, and satisfactory progress is being made.

A new, simplified, and more accurate method of tidal prediction has been devised by Dr. A. T. Doodson, F.R.S., Associate Director of the Liverpool Observatory and Tidal Institute, and Commander H. D. Warburg, R.N., of the Hydrographic Department. This method will be gradually brought into use in the Service.

The contract for the construction of the Research, the non-magnetic vessel which is being provided for the continuance of observations to determine magnetic variations at sea, will be placed shortly. In making preparations for the resumption of this work, which is of value to the whole world, the Hydrographer has received much assistance from the Department of Research in Terrestrial Magnetism of the Carnegie

Institution of Washington, and Mr. W. J. Peters, formerly of that Department, has been sent to England specially in order that his services as consultant may be at the disposal of the Admiralty.

The Admiralty are collaborating cordially with the International Hydrographic Bureau, Monaco, in their scheme under which Notices to Mariners, published by the various nations, are made available for consultation by shipmasters generally at centralised addresses in the principal ports throughout the world. These arrangements are supplementary to the long-established organisation whereby British shipmasters may obtain copies of the Admiralty Notices at British Consulates, etc.

METEOROLOGY.

Progress continued during 1935, in collaboration with the Air Ministry, in the development of Fleet meteorology, and a comprehensive organisation for Fleet requirements is gradually being brought into force. The improvement of meteorological instruments, and the collection of meteorological data, continue.

NAVIGATION.

The policy of equipping H.M. Ships with modern aids to navigation such as Speed and Distance Recorders, Automatic Course Recorders, and Echo Sounding Gear, continues.

FISHERY PROTECTION.

During the past year the Captain Commanding the Fishery Protection Flotilla visited Belgium, and vessels under his command paid visits to ports in France, Germany, Norway, Belgium, and Iceland.

CO-OPERATION BETWEEN THE SERVICES.

It seems necessary to stress once again the fact that the vital importance of close co-operation between the three Services is kept constantly in mind in the Navy. As was pointed out in these notes last year,—

> " The Chiefs of Staff are in frequent consultation, and no effort is spared to establish that close liaison between the personnel, and that common doctrine on matters of joint concern, which are essential for the most efficient collaboration."
>
> " The principle of co-operation is also fostered at the Imperial Defence College, where senior officers from the three Services meet as students. It forms, too, one of the most important parts of the teaching at the Naval Staff College. During the year spent at the Staff College, the younger officers are brought into the closest touch with the students at Camberley and Andover."

The special conditions which have existed during the past six or seven months have also necessitated constant consultation and co-operation between the three Services, both at home and abroad, and their relations have been those of close and cordial collaboration.

Combined operations with the Army and the Royal Air Force have been held both at home and abroad, and the usual exercises between the Staff Colleges of the three Services have also taken place.

Amongst the operations carried out have been exercises to test the efficiency of the defence arrangements of various naval ports at home and abroad against attack by air and sea, exercises designed to enable squadrons of the Royal Air Force to practise locating and attacking ships at sea, and landing operations, involving both Naval and Military forces.

There have also been extensive investigations, with the co-operation of service units of the Royal Air Force, into the best means of controlling close range anti-aircraft guns. As a result it is confidently expected that the effectiveness of these weapons will be materially increased.

FLEET TRAINING AND NAVAL AIR WORK.

The Tactical Training of the Fleet during the first half of the year proceeded normally. As in 1934, the principal exercise took place in the Atlantic in March and lasted eight days. In this exercise, which was designed to investigate the problem of the defence of our sea-borne trade, all available units of the Home and Mediterranean Fleets took part and, in addition, all ships of the British Merchant Navy normally passing through the area during the period of the exercise voluntarily co-operated. This whole-hearted co-operation, cheerfully given, was of the greatest value to all concerned and enabled the exercises to be conducted as nearly as possible under the conditions to be expected in time of war.

Most valuable experience was also obtained in the operation of the aircraft of the Fleet in oceanic warfare over a prolonged period. Weather conditions were suitable for flying throughout the exercise, and the Fleet Air Arm carried out a full flying programme each day, embracing extended reconnaissance, striking-force operations, and anti-submarine patrols.

The value of the Fleet Air Arm to the Navy, the advantage which superior numbers of seaborne aircraft confer on a Fleet, and the necessity for their adequate Naval training, were again clearly demonstrated.

Apart from the strategical and tactical experience gained, this exercise also provided a searching and satisfactory test of the general efficiency of the Fleet as a whole. Although ships were steaming at varying and often high speeds throughout the eight days, and extensive flying operations were involved, no single case of failure or breakdown was reported.

PERSONNEL.

Increased numbers of Cadets are now being entered in order to meet the requirements of the Fleet, and in particular of the Fleet Air Arm.

The upper age limit for the Special Entry has been raised to 18½.

The improvement in the number of candidates for commissions in the Royal Marines, which has occurred during the last three years, has been well maintained.

Entries for the Naval Medical Service have continued to be satisfactory during the past year. Improvements have been introduced in the Naval Dental Service, which should make it more attractive to civilian dental surgeons.

The number of pilots taken for training annually for the Fleet Air Arm has been further increased this year from 24 to 34 ; the number of Observer officers taken has, owing to the introduction of Observer's Mates referred to later, remained, as before, 18.

The ketch Tai Mo Shan, which was built at Hong Kong and sailed home by five naval officers, was purchased by the Admiralty in March, 1935, and is now being used for giving junior officers experience in cruising under sail, and teaching them self-reliance and seamanship.

The advancement of men in substantive and non-substantive rates continues to be rapid, and prospects in the Service are now very favourable for men with ambition and ability.

The age of recruitment for Special Service Ratings has been lowered to 16½ years, in order to bridge the gap between the upper age limit for Boys and the old lower limit for Special Service Seamen. All Special Service Seamen have the same opportunities of advancement as Continuous Service Ratings, and, if recommended, they may transfer to continuous service after two years.

The large influx of young ratings to the Fleet has emphasised the desirability of a Training Squadron for Boys leaving the Training Establishments, so as to relieve ships belonging to the main Fleets of their undesirably heavy training duties. One ship is already used solely for this purpose and it may be necessary to add more in the near future.

To promote the efficiency of the Fleet Air Arm, the non-substantive rating of Telegraphist Air Gunner is being replaced by a non-substantive rating of Air Gunner, open to the Seamen, Signal, and Telegraphist branches, and a new higher non-substantive rating of Observer's Mate, open to selected Air Gunners, has been created. Observer's Mates perform Air duties similar to those of Telegraphist Air Gunners but are required to reach a special standard of efficiency and training, and they also undertake certain air duties which have been discharged by Observer Officers.

A scheme has been inaugurated whereby sound film equipment and films are hired to H.M. Ships and Establishments for recreational purposes, without expenditure from public funds. An organisation for co-ordinating the purchase and supply of apparatus and the hire of films has been set up, and cinema entertainment of the best quality has thus been brought within the means of relatively small units of the Navy. This will greatly contribute to the well-being of the personnel, particularly on foreign stations.

A welfare and marriage allowance organisation has been established at each of the three Home Ports under the Commodore of the Naval Barracks to advise and assist naval ratings and their families in any domestic troubles.

The naval dispositions during the last six months have made it necessary to postpone the review of Service conditions which it had been the intention to hold in all Commands in September or October, 1935.

MATERIAL. NEW CONSTRUCTION.

AIRCRAFT CARRIER.

1934 *Programme.*

The Ark Royal, the Aircraft Carrier of the 1934 Programme, with a standard displacement of 22,000 tons, was ordered from Messrs. Cammell Laird & Co., Ltd., in April, 1935, and is due for completion in July, 1938.

CRUISERS.

1931 *Programme.*

The Ajax, the fifth ship of the "Leander" Class, was completed by Messrs. Vickers-Armstrong, Ltd., in April, 1935.

The Amphion, the first of the modified "Leander" Class, building at Portsmouth, is expected to complete about the end of July, 1936.

The Arethusa, the first of the class of smaller cruisers of 5,200 tons, was completed at Chatham in May, 1935.

1932 *Programme.*

The Apollo, of the modified "Leander" Class, was completed at Devonport in January, 1936.

The Sydney, also of the modified "Leander" Class, built by Messrs. Swan, Hunter & Wigham Richardson, Ltd., and taken over by the Commonwealth of Australia, was completed in September, 1935.

The Galatea, the second ship of the "Arethusa" Class, was completed by Messrs. Scotts' Shipbuilding & Engineering Co., Ltd., in August, 1935.

1933 *Programme.*

The Southampton and the Newcastle, the first two vessels of the "Southampton" Class, orders for which were placed during 1934, are expected to be completed in March, 1937. The Newcastle, under construction by Messrs. Vickers-Armstrongs, Ltd., Walker-on-Tyne, was launched on the 23rd January, 1936, and the Southampton, which is being built by Messrs. John Brown & Co., Ltd., Clydebank, will be launched on the 10th March, 1936.

The Penelope, the third ship of the "Arethusa" Class, under construction by Messrs. Harland & Wolff, Ltd., Belfast, was launched on 15th October, 1935, and is due to complete in September, 1936.

1934 *Programme.*

The Sheffield and the Glasgow, under construction by Messrs. Vickers-Armstrongs, Ltd., Walker-on-Tyne, and Messrs. Scotts' Shipbuilding & Engineering Co., Ltd., Greenock, respectively, will probably be launched in June, 1936.

The keel of the Birmingham, also of the "Southampton" Class, was laid at Devonport on the 18th July, 1935, and it is expected that the vessel will be launched about September next.

The Aurora, the fourth ship of the "Arethusa" Class, building at Portsmouth, is expected to be launched in August, 1936.

1935 *Programme.*

Orders were placed on the 11th November, 1935, for the construction of two further Cruisers of the "Southampton" Class, to be built by contract, the Liverpool by Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., at Govan, and the Manchester by Messrs. Hawthorn, Leslie & Co., Ltd., at Hebburn-on-Tyne. The keel of the Liverpool was laid on the 17th February, 1936.

The Gloucester, a Cruiser of the same class, will be built at Devonport Dockyard. Orders have been given for the work to be commenced on the 2nd March, 1936.

LEADERS AND DESTROYERS.

1932 *Programme.*

The Flotilla Leader Faulknor and the eight vessels of the "Fearless" Class, ordered under the 1932 Programme, were completed during the period December, 1934, to June, 1935.

1933 *Programme.*

The Flotilla Leader Grenville will complete in April, 1936, and the eight Destroyers of the " Greyhound " Class will all have been delivered before the end of the financial year 1935.

1934 *Programme.*

The construction of the Flotilla Leader Hardy and the eight Destroyers of the " Hero " Class, ordered in December, 1934, is proceeding satisfactorily, and it is anticipated that they will all have been completed by the end of December, 1936.

1935 *Programme.*

Orders for the building of the Flotilla Leader Inglefield and eight Destroyers of the " Intrepid " Class were placed on the 30th October, 1935, as follows :—

Inglefield	Messrs. Cammell, Laird & Co., Ltd., Birkenhead.
Icarus and Ilex	Messrs. John Brown & Co., Ltd., Clydebank.
Imogen and Imperial ..	Messrs. Hawthorn, Leslie & Co., Ltd., Hebburn-on-Tyne.
Intrepid and Impulsive ..	Messrs. J. S. White & Co., Ltd., Cowes.
Isis and Ivanhoe.. ..	Messrs. Yarrow & Co., Ltd., Scotstoun.

In addition, contracts for the flotilla of seven " Tribal " Class Destroyers, for the commencement of which provision has been made in the Supplementary Estimate, 1935, are being placed with the following firms :—

Afridi Cossack	Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness.
Ghurka Maori	Messrs. The Fairfield Shipbuilding & Engineering Co., Ltd., Govan.
Mohawk Nubian	Messrs. John I. Thornycroft & Co., Ltd., Southampton.
Zulu ..	Messrs. Alex. Stephen & Sons, Ltd., Govan.

SUBMARINES.

1932 *Programme.*

The Clyde, a sister vessel of the Severn, was completed at the works of Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, on 12th April, 1935.

The Salmon and the Snapper, of the " Swordfish " Class, were completed, the former at the works of Messrs. Cammell, Laird & Co., Ltd., in March, 1935, and the latter at Chatham in June, 1935.

1933 *Programme.*

The minelayer submarine Narwhal, of the " Porpoise " Class, building at the works of Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, will complete very shortly. The sister vessel Grampus, building at Chatham Dockyard, will probably be completed in November, 1936.

The Seawolf, of the " Swordfish " Class, building by Messrs. Scotts' Shipbuilding & Engineering Co., Ltd., is due to complete on the 12th March, 1936.

1934 *Programme.*

The Rorqual, a further vessel of the " Porpoise " Class, was laid down at the works of Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, on the 1st May, 1935, and is due to complete early in 1937.

The Spearfish and the Sunfish, of the " Swordfish " Class, were laid down at the works of Messrs. Cammell, Laird & Co., Ltd., on the 23rd May, 1935, and at Chatham Dockyard on the 22nd July, 1935, respectively. The former is expected to complete towards the end of 1936 and the latter early in 1937.

1935 *Programme.*

A minelayer submarine, the Cachalot, of the " Porpoise " Class, is to be built by Messrs. Scotts' Shipbuilding & Engineering Co., Ltd., Greenock, and the Triton, the first vessel of a new class designed for general service, by Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness.

The Sterlet, of the " Swordfish " Class, will be built at Chatham Dockyard. Orders have been given for the work to be begun on the 2nd March.

SLOOPS.

The Londonderry and the Deptford, two "Grimsby" Class Sloops of the 1933 Programme, have been completed at Devonport and Chatham respectively, during the present financial year. Similar Sloops of the 1934 Programme, the Aberdeen and the Fleetwood, are building at Devonport, and should complete during the autumn of 1936.

The Sloop Minesweeper Speedwell ("Halcyon" Class), of the 1933 Programme, built by Messrs. W. Hamilton & Co., Ltd., Port Glasgow, has been completed during the financial year 1935, and the similar vessels, Niger and Salamander, of the 1934 Programme, under construction by Messrs. J. S. White & Co., Ltd., Cowes, are expected to be completed during the summer of 1936. Two Sloop Minesweepers of the 1935 Programme, the Hebe and the Sharpshooter, are about to be begun at Devonport for completion during the financial year 1937; the Hazard, the third vessel of this type included in the 1935 Programme, will be built by Messrs. Gray & Co., Ltd., West Hartlepool. This firm will also build the Gleaner, a Sloop Minesweeper for Surveying duties, of the 1935 Programme.

The Convoy Sloop Enchantress, of the 1933 Programme, was completed by Messrs. John Brown & Co., Ltd., in April, 1935. The Bittern, a Convoy Sloop of the 1935 Programme, to be built by contract, will be ordered shortly.

The Stork, of the 1934 Programme, a Convoy Sloop fitted also for surveying duties, is being built by Messrs. Wm. Denny Bros., Ltd., Dumbarton, and is due to complete during the financial year 1936.

The Coastal Sloop Kingfisher, of the 1933 Programme, was completed during the financial year 1935. The Mallard and the Puffin, similar vessels of the 1934 Programme, are under construction by Messrs. A. Stephen & Sons, Ltd., Govan, and are due to be completed by September, 1936. The Kittiwake and the Sheldrake, further similar ships of the 1935 Programme, were ordered from Messrs. J. I. Thornycroft & Co., Ltd., Southampton, on the 21st January, 1936, for completion during the financial year 1937.

DEPOT SHIP FOR DESTROYER FLOTILLAS.

The Woolwich, Depot Ship for Destroyer Flotillas, of the 1932 Programme, was completed in June, 1935, by Messrs. The Fairfield Shipbuilding & Engineering Co., Ltd., Govan.

DEPOT SHIP FOR SUBMARINES.

Tenders for the construction by contract of the Maidstone, Depot Ship for Submarines, of the 1935 Programme, have been received, and an order will be placed very shortly.

OTHER VESSELS.

The Protector, Netlayer of the 1934 Programme, was laid down by Messrs. Yarrow & Co., Ltd., Scotstoun, on the 15th August, 1935, and is expected to be completed in the latter part of the financial year 1936.

The Dowgate and the Ludgate, Boom Gate Vessels of the 1934 Programme, were completed by Messrs. The Hong Kong & Whampoa Dock Co., Ltd., at Hong Kong in November, 1935.

The Dunnet, Boom Working Vessel of the 1934 Programme, under construction by Messrs. Lytham Shipbuilding Company, Ltd., is expected to complete about June, 1936.

The Dwarf, Submarine School tender of the 1934 Programme, ordered from Messrs. Philip & Son, Ltd., Dartmouth, on the 8th October, 1935, is due to be completed in April, 1936.

The Basset, a Trawler of the 1934 Programme, was completed by Messrs. Henry Robb, Ltd., Leith, in November, 1935.

The Plover, Mining School Tender of the 1935 Programme, is to be built by contract and will be ordered shortly.

The 1935 Programme, as originally presented, included provision for the construction of two Trawlers. As indicated in the Navy Supplementary Estimate, 1935, however, immediate requirements arose for 20 Trawlers, which were purchased from private owners and converted for naval service. The two Trawlers will, therefore, not be built.

Orders have been placed with the British Power Boat Co. for the construction of six Motor Torpedo Boats (formerly called Coastal Motor Boats), with a view to completion as early as possible. These boats, as indicated in the recent Navy Supplementary Estimate, are additional to the 1935 Programme as originally presented.

LARGE REPAIRS.

The large repairs of the Glorious and the Enterprise were completed in August, 1935, and January, 1936, respectively.

The large repairs of the Repulse, which has been in hand at Portsmouth since April, 1933, are nearing completion.

The Warspite is in hand at Portsmouth for large repairs, including re-engining and re-boilering. On completion of the work about March, 1937, it is contemplated that the Nelson will be taken in hand for large repairs.

Large repairs of the Renown, including re-engining and re-boilering, will probably be taken in hand early in the financial year, 1936.

The Royal Oak and the Malaya, which are undergoing large repairs at Devonport, will, it is anticipated, complete about August and December, 1936, respectively. Similar repairs to the Revenge will probably be taken in hand on completion of the Royal Oak.

The Cumberland, taken in hand for large repairs and alterations at Chatham in March, 1935, is due to complete about July, 1936.

Large repairs and alterations to the Suffolk are also being carried out at Chatham and the work is due for completion in January, 1937.

Similar repairs, etc., to the Cornwall and the Kent will, it is anticipated, commence at Chatham about September, 1936, and February, 1937, respectively.

FAST MOTOR BOATS.

As a result of extensive trials carried out during the last year with various makes of fast petrol-driven motor boats of the planing type, a number of these craft have been introduced into the Naval Service. Such boats will in future be the standard type for use by H.M. Ships and for certain Harbour Services.

AIRCRAFT EQUIPMENT.

The installation of aircraft equipment in existing ships and in new construction has progressed according to programme.

Twenty-nine Capital Ships and Cruisers are now fitted with catapults, and 37 aircraft are embarked in the vessels so fitted. In addition, aircraft are carried in the Nelson and the Frobisher, although these ships are not yet fitted with catapults.

NAVAL WORKS.

The principal new works for which provision is made comprise new quarters at Bermuda for single workmen transferred from the Home Dockyards, underpinning and underwater repairs to wharf walls at Malta, reconstruction of a jetty at Plymouth, and a new Boat House at Portsmouth.

The existing wooden Boat House at Portsmouth was built in 1693, and now constitutes a serious source of danger through risk of fire, besides being inefficient, uneconomical, and quite inadequate for the needs of the Fleet and the Port.

The re-provision of accommodation for Submarine Service personnel at Fort Blockhouse is still proceeding, and this year £32,800 is provided for the third and final section of the work.

The Jackson contract for works at Singapore, which was due for completion on 28th September, 1935, was extended to 14th February, 1936, as the firm has carried out extra work additional to the contract.

ADMIRALTY ADMINISTRATION.

Sir Vincent W. Baddeley, K.C.B., Deputy Secretary of the Admiralty, retired on 31st December, 1935, after a distinguished public service extending over 38 years. He has been succeeded by Mr. J. S. Barnes, C.B., O.B.E.

The decline that has been evident for some years in the number and quality of young men taking up the profession of naval construction has been causing anxiety to the Admiralty, and the question of the steps necessary to maintain the high standard desirable for entry to the Royal Corps of Naval Constructors is receiving attention.

DOCKYARD ADMINISTRATION.

The process of introducing the changes recommended by Mr. R. S. Hilton's Committee on the financial system of the Dockyards has now been completed in all Establishments at home and abroad. The methods of muster of workpeople by time clock and of paying wages at the clocking stations adopted at the three large yards have proved very satisfactory.

Economical management has been assisted as a result of the details reflected under the new system, and with a wider experience of the scheme further economies are to be expected.

The adoption of this revised system has facilitated a revision of the annual Blue Book comprising the Dockyard Accounts, and from this year forward it will present the account of Dockyard transactions in a more concise and intelligible form.

GENERAL PROGRESS.

Welded heavy-oil engine frames have proved successful on service and the technique of the process has been introduced in Chatham Dockyard.

The work on the Velox Steam Generator is well advanced and preliminary trials will be commenced at an early date.

Close touch is being kept with the development of other advanced types of steam generators with a view to their possible use in H.M. Service.

At the Admiralty Engineering Laboratory, in addition to development work on existing submarine units, work on high speed internal combustion units has been progressed. Some advance has been made in the many metallurgical problems arising in new designs.

Several high speed heavy-oil driven generators have been fitted in surface ships, marked improvement in power weight ratio having been attained with this type of machinery.

The use of increased steam pressure and temperature air preheaters and higher boiler forcing rates has resulted in considerable economy in weight and fuel consumption.

The development at Haslar Fuel Experimental Station of devices to improve the circulation in boilers in conjunction with modified feed supply arrangements has enabled forcing rates to be considerably increased while the necessary margin of safety is retained. The lower efficiencies which normally accompany higher forcing rates have been avoided by modified heating surface arrangements.

ABSTRACT OF NAVY ESTIMATES FOR 1936.

Votes.		Estimates 1936.		Estimates 1935.
		Gross Estimate.	Net Estimate.	Net Estimate.
	I.—NUMBERS.		Maximum Numbers.	Maximum Numbers.
A	Number of Officers, Seamen, Boys, and Royal Marines	99,095	99,095	94,482
	Number of Royal Marine Police	888	888	888
	II.—EFFECTIVE SERVICES.	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services	13,647,650	13,572,700	12,868,000
2	Victualling and Clothing for the Navy	4,033,855	3,400,000	3,281,400
3	Medical Establishments and Services	454,530	384,500	376,200
4	Fleet Air Arm	3,066,000	3,066,000	1,873,000
5	Educational Services	270,900	204,000	195,100
6	Scientific Services	569,700	492,000	474,000
7	Royal Naval Reserves	350,890	350,700	350,500
8	Shipbuilding, Repairs, Maintenance, etc.:			
	Section I.—*Personnel*	7,127,105	7,072,000	6,806,500
	Section II.—*Matériel*	6,321,500	5,752,300	4,827,200
	Section III.—Contract Work	15,013,630	14,441,000	10,723,600
9	Naval Armaments	7,497,400	7,115,300	4,800,000
10	Works, Buildings, and Repairs at Home and Abroad	2,537,500	2,450,500	2,209,750
11	Miscellaneous Effective Services	799,000	721,300	626,750
12	Admiralty Office	1,190,769	1,183,000	1,130,000
	Total Effective Services £	62,880,429	60,205,300	50,542,000
	III.—NON-EFFECTIVE SERVICES.			
13	Naval and Marine, Officers	3,234,684	3,219,000	3,200,000
14	Naval and Marine, Men	5,372,450	5,276,000	5,137,000
15	Civil Superannuation, Compensation Allowances, and Gratuities	1,232,563	1,229,700	1,171,000
	Total Non-Effective Services £	9,839,697	9,724,700	9,508,000
	GRAND TOTAL £	72,720,126	69,930,000	60,050,000

NET INCREASE . . . . . £9,880,000.

ADMIRALTY.
18 *Feb.*, 1936.

MONSELL,
ERNLE CHATFIELD,
M. E. DUNBAR-NASMITH,

R. G. H. HENDERSON,
PERCY NOBLE,
W. M. JAMES,
C. E. KENNEDY-PURVIS.

STANLEY,
KENNETH M. LINDSAY,
O. MURRAY,

STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1917 TO 1934, AND THE ESTIMATES FOR 1935 AND 1936.

YEAR	VOTE A. — Average numbers borne. (a)	VOTE 1. — Wages, &c., of Officers, &c	VOTE 2. — Victualling and Clothing.	VOTE 3. — Medical Establishments, &c.	VOTE 4. — Civilians employed on Fleet Services.	VOTE 5. — Educational Services.	VOTE 6. — Scientific Services.	VOTE 7. — Royal Naval Reserves.	VOTE 8. — Shipbuilding, Repairs, Maintenance, &c.			VOTE 9. — Naval Armaments.	VOTE 10. — Works.	VOTE 11. — Miscellaneous.	VOTE 12. — Admiralty Office.	VOTE 13. — Half Pay, &c	VOTE 14. — Naval, &c., Pensions.	VOTE 15. — Civil Superannuation, &c.	Balances Irrecoverable.	Total Expenditure
									Section I. Personnel.	Section II. Matériel.	Section III. Contract Work.									
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1917	406,977	37,559,536	13,481,159	792,569	561,308	210,243	152,160	874,930	12,660,160	36,494,694	70,609,055	34,177,359	6,556,799	9,193,802	1,454,835	709,227	1,446,247	413,746	41,092	227,388,891
1918	381,311	46,373,511	24,219,351	1,158,287	491,270	247,922	262,886	871,970	15,037,763	59,128,675	94,248,874	64,866,784	10,928,241	9,357,532	1,985,894	704,914	3,733,778	445,485	28,090	334,091,227
1919	176,087	32,385,306	8,823,106	733,046	556,778	401,864	364,832	458,044	12,426,177	*Credit :—* *785,986*	48,348,933	14,441,835	5,595,608	11,118,631	2,042,715	1,176,937	15,133,064	802,279	60,875	154,084,044
1920	124,009	21,314,360	8,311,708	683,830	759,110	503,152	249,185	359,694	12,096,747	6,799,965	12,001,445	8,493,951	4,992,969	5,724,974	2,073,764	2,352,344	4,847,475	880,996	23,611	92,505,290
1921	127,180	19,220,859	6,831,481	643,735	480,243	405,592	359,575	423,056	10,690,188	8,835,771	4,834,336	6,253,468	4,746,485	3,506,514	1,780,641	2,002,201	3,881,368	1,020,693	69,935	75,986,141
																Non-effective Services. Officers.	Men.			
1922	107,782	15,762,232	4,767,118	492,419	258,600	382,065	354,961	423,722	7,075,533	3,877,716	3,225,598	3,678,783	3,553,831	2,096,219	1,371,961	3,701,984	5,471,088	968,880	29,679	57,492,389
1923	99,107	14,175,111	4,153,803	410,842	193,793	330,644	379,489	459,391	6,751,496	5,521,336	4,427,874	3,840,606	3,215,766	982,173	1,247,813	2,856,764	4,260,245	823,340	33,864	54,064,350
1924	99,453	14,150,863	4,152,902	442,756	190,669	334,648	393,054	446,902	7,489,659	5,592,183	5,415,210	3,507,190	3,140,887	1,065,869	1,349,519	2,868,798	4,328,526	811,797	12,355	55,633,787
1925	100,284	14,576,499	4,226,570	440,209	Fleet Air Arm (b) 1,320,000	327,226	417,552	465,114	7,929,259	6,905,184	6,395,406	4,247,113	2,422,050	826,119	1,307,790	2,812,336	4,449,585	928,326	8,110	60,004,548
1926	100,791	14,322,678	4,236,846	434,919	681,000	324,036	393,339	444,759	7,487,952	5,422,141	7,275,173	3,595,037	2,108,441	930,369	1,203,639	2,914,419	4,450,140	894,472	23,002	57,142,862
1927	101,916	14,568,462	4,182,491	423,777	882,000	224,334	402,976	419,086	7,067,419	4,678,052	8,839,423	3,996,749	1,900,788	844,852	1,233,132	2,966,485	4,525,353	965,602	2,276	58,123,257
1928	100,680	14,435,347	3,992,639	418,863	1,008,300	226,486	396,298	403,295	6,743,571	5,074,290	8,263,060	3,871,235	1,950,207	728,841	1,181,125	3,006,321	4,496,310	944,735	4,223	57,139,146
1929	99,300	14,286,313	3,840,098	419,371	1,066,000	226,449	467,343	387,241	6,561,827	4,977,230	7,291,217	3,868,359	2,079,775	725,511	1,194,842	3,075,856	4,550,155	968,944	1,239	55,987,770
1930	94,921	13,996,225	3,531,280	394,505	1,267,000	224,722	470,965	395,648	6,227,647	4,198,553	5,532,728	3,557,624	1,928,639	667,107	1,178,675	3,121,672	4,592,970	963,198	5,033	52,274,186
1931	92,449	13,432,777	3,145,731	379,239	1,126,000	219,367	451,498	394,007	6,331,341	4,517,054	4,717,751	3,326,274	2,399,570	683,774	1,114,266	3,123,312	4,625,833	1,026,306	652	51,014,752
1932	89,667	12,636,077	2,980,931	361,229	1,025,000	207,142	453,149	346,552	6,262,431	4,190,785	5,429,049	3,318,886	2,374,150	562,029	1,086,182	3,125,419	4,741,854	1,060,833	2,455	50,164,453
1933	89,863	12,514,488	3,182,430	376,228	1,089,000	194,742	454,819	373,092	6,192,587	4,351,666	7,905,227	3,767,355	2,243,564	572,722	1,079,214	3,231,172	4,857,822	1,055,710	1,707	53,443,545
1934	91,351	12,688,561	3,146,979	366,069	1,338,000	194,079	455,883	342,052	6,527,160	4,763,966	9,634,067	4,034,459	2,068,310	553,411	1,105,578	3,260,867	5,008,397	1,122,976	1,196	56,616,010
1935 (estimate)	94,482(b)	12,868,000	3,281,400	376,200	1,873,000	195,100	474,000	350,500	6,806,500	4,827,200	10,723,600	4,800,000	2,209,750	626,750	1,130,000	3,200,000	5,137,000	1,171,000	—	60,050,000
1936 (estimate)	99,095(b)	13,572,700	3,400,000	384,500	3,066,000	204,000	492,000	350,700	7,072,000	5,752,300	14,441,000	7,115,300	2,450,500	721,300	1,183,000	3,219,000	5,276,000	1,229,700	—	69,930,000

Note.—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Accounts as receipts in excess of estimated Appropriations in Aid.

(*a*) Exclusive of Royal Marine Police.

(*b*) Maximum bearing.

THE LONDON NAVAL TREATY, 1936.

Full Text of the Agreement.

The following is the text (Cmd. 5136) of the Naval Treaty for limiting naval construction for the six years 1937–42 inclusive which was signed on March 25, 1936, at St. James's Palace by representatives of the United States, France, and the British Commonwealth of Nations :—

The President of the United States of America, the President of the French Republic and His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India ;

Desiring to reduce the burdens and prevent the dangers inherent in competition in naval armament ;

Desiring, in view of the forthcoming expiration of the Treaty for the Limitation of Naval Armament signed at Washington on the 6th February, 1922, and of the Treaty for the Limitation and Reduction of Naval Armament signed in London on the 22nd April, 1930 (save for Part IV thereof), to make provision for the limitation of naval armament, and for the exchange of information concerning naval construction ;

Have resolved to conclude a Treaty for these purposes and have appointed as their Plenipotentiaries :—

The President of the United States of America :
  The Honourable Norman H. Davis ;
  Admiral William H. Standley, United States Navy, Chief of Naval Operations ;

The President of the French Republic :
  His Excellency Monsieur Charles Corbin, Ambassador Extraordinary and Plenipotentiary of the French Republic at the Court of St. James ;
  Vice-Admiral Georges Robert, Member of the Supreme Naval Council, Inspector-General of the Naval Forces in the Mediterranean ;

His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India :
  for Great Britain and Northern Ireland and all parts of the British Empire which are not separate Members of the League of Nations :
    The Right Honourable Anthony Eden, M.C., M.P., His Principal Secretary of State for Foreign Affairs ;

The Right Honourable Viscount Monsell, G.B.E., First Lord of His Admiralty;
Lieutenant-Colonel the Earl Stanhope, K.G., D.S.O., M.C., D.L., Parliamentary Under Secretary of State for Foreign Affairs;

for the Dominion of Canada:
The Honourable Vincent Massey, High Commissioner for the Dominion of Canada in London;

for the Commonwealth of Australia:
The Right Honourable Stanley Melbourne Bruce, C.H., M.C., High Commissioner for the Commonwealth of Australia in London;

for the Dominion of New Zealand:
The Honourable Sir Christopher James Parr, G.C.M.G., High Commissioner for the Dominion of New Zealand in London;

for India:
Richard Austen Butler, Esquire, M.P., Parliamentary Under Secretary of State for India.

Who, having communicated to one another their full powers, found in good and due form, have agreed as follows:

PART I

DEFINITIONS

Article 1

For the purposes of the present Treaty, the following expressions are to be understood in the sense hereinafter defined.

A.—*Standard Displacement.*

(1) The standard displacement of a surface vessel is the displacement of the vessel, complete, fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions and fresh water for crew, miscellaneous stores and implements of every description that are intended to be carried in war, but without fuel or reserve feed water on board.

(2) The standard displacement of a submarine is the surface displacement of the vessel complete (exclusive of the water in non-watertight structure), fully manned, engined and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions for crew, miscellaneous stores and implements of every description that are intended to be carried in war, but without fuel, lubricating oil, fresh water or ballast water of any kind on board.

(3) The word "ton" except in the expression "metric tons" denotes the ton of 2,240 lb. (1,016 kilos).

B.—*Categories.*

(1) *Capital Ships* are surface vessels of war belonging to one of the two following sub-categories :—

(*a*) surface vessels of war, other than aircraft carriers, auxiliary vessels, or capital ships of sub-category (*b*), the standard displacement of which exceeds 10,000 tons (10,160 metric tons) or which carry a gun with a calibre exceeding 8 in. (203 mm.) ;

(*b*) surface vessels of war, other than aircraft-carriers, the standard displacement of which does not exceed 8,000 tons (8,128 metric tons) and which carry a gun with a calibre exceeding 8 in. (203 mm.).

(2) *Aircraft-Carriers* are surface vessels of war, whatever their displacement, designed or adapted primarily for the purpose of carrying and operating aircraft at sea. The fitting of a landing-on or flying-off deck on any vessel of war, provided such vessel has not been designed or adapted primarily for the purpose of carrying and operating aircraft at sea, shall not cause any vessel so fitted to be classified in the category of aircraft-carriers.

The category of aircraft-carriers is divided into two sub-categories as follows :—

(*a*) vessels fitted with a flight deck, from which aircraft can take off, or on which aircraft can land from the air ;

(*b*) vessels not fitted with a flight deck as described in (*a*) above.

(3) *Light Surface Vessels* are surface vessels of war other than aircraft-carriers, minor war vessels or auxiliary vessels, the standard displacement of which exceeds 100 tons (102 metric tons) and does not exceed 10,000 tons (10,160 metric tons), and which do not carry a gun with a calibre exceeding 8 in. (203 mm.).

The category of light surface vessels is divided into three sub-categories as follows :—

(*a*) vessels which carry a gun with a calibre exceeding 6·1 in. (155 mm.) ;

(*b*) vessels which do not carry a gun with a calibre exceeding 6·1 in. (155 mm.) and the standard displacement of which exceeds 3,000 tons (3,048 metric tons) ;

(*c*) vessels which do not carry a gun with a calibre exceeding 6·1 in. (155 mm.) and the standard displacement of which does not exceed 3,000 tons (3,048 metric tons).

(4) *Submarines* are all vessels designed to operate below the surface of the sea.

(5) *Minor War Vessels* are surface vessels of war, other than auxiliary vessels, the standard displacement of which exceeds 100 tons (102 metric tons) and does not exceed 2,000 tons (2,032 metric tons), provided they have none of the following characteristics :—

(*a*) mount a gun with a calibre exceeding 6·1 in. (155 mm.) ;

(*b*) are designed or fitted to launch torpedoes ;

(*c*) are designed for a speed greater than twenty knots.

(6) *Auxiliary Vessels* are naval surface vessels the standard displacement of which exceeds 100 tons (102 metric tons), which are normally employed on fleet duties or as troop transports, or in some other way than as fighting ships, and which are not specifically built as fighting ships, provided they have none of the following characteristics :—

(*a*) mount a gun with a calibre exceeding 6·1 in. (155 mm.) ;

(*b*) mount more than eight guns with a calibre exceeding 3 in. (76 mm.) ;

(*c*) are designed or fitted to launch torpedoes ;

(*d*) are designed for protection by armour plate ;

(*e*) are designed for a speed greater than twenty-eight knots ;

(*f*) are designed or adapted primarily for operating aircraft at sea ;

(*g*) mount more than two aircraft-launching apparatus.

(7) *Small Craft* are naval surface vessels the standard displacement of which does not exceed 100 tons (102 metric tons).

C.—*Over Age.*

Vessels of the following categories and sub-categories shall be deemed to be " over-age " when the undermentioned number of years have elapsed since completion :—

(*a*) Capital ships	26 years.
(*b*) Aircraft-carriers	20 years.
(*c*) Light surface vessels, sub-categories (*a*) and (*b*) :	
(i) if laid down before 1st January, 1920	16 years.
(ii) if laid down after 31st December, 1919	20 years.
(*d*) Light surface vessels, sub-category (*c*) .	16 years.
(*e*) Submarines	13 years.

D.—Month.

The word " month " in the present Treaty with reference to a period of time denotes the month of thirty days.

Part II

LIMITATION

Article 2

After the date of the coming into force of the present Treaty, no vessel exceeding the limitations as to displacement or armament prescribed by this Part of the present Treaty shall be acquired by any High Contracting Party or constructed by, for or within the jurisdiction of any High Contracting Party.

Article 3

No vessel which at the date of the coming into force of the present Treaty carries guns with a calibre exceeding the limits prescribed by this Part of the present Treaty shall, if reconstructed or modernised, be rearmed with guns of a greater calibre than those previously carried by her.

Article 4

(1) No capital ship shall exceed 35,000 tons (35,560 metric tons) standard displacement.

(2) No capital ship shall carry a gun with a calibre exceeding 14 in. (356 mm.); provided however that if any of the Parties to the Treaty for the Limitation of Naval Armament signed at Washington on the 6th February, 1922, should fail to enter into an agreement to conform to this provision prior to the date of the coming into force of the present Treaty, but in any case not later than the 1st April, 1937, the maximum calibre of gun carried by capital ships shall be 16 in. (406 mm.).

(3) No capital ship of sub-category (*a*), the standard displacement of which is less than 17,500 tons (17,780 metric tons), shall be laid down or acquired prior to the 1st January, 1943.

(4) No capital ship, the main armament of which consists of guns of less than 10 in. (254 mm.) calibre, shall be laid down or acquired prior to the 1st January, 1943.

Article 5

(1) No aircraft carrier shall exceed 23,000 tons (23,368 metric tons) standard displacement or carry a gun with a calibre exceeding 6·1 in. (155 mm.).

(2) If the armament of any aircraft carrier includes guns exceeding 5·25 in. (134 mm.) in calibre, the total number of guns carried which exceed that calibre shall not be more than ten.

Article 6

(1) No light surface vessel of sub-category (*b*) exceeding 8,000 tons (8,128 metric tons) standard displacement, and no light surface vessel of sub-category (*a*) shall be laid down or acquired prior to the 1st January, 1943.

(2) Notwithstanding the provisions of paragraph (1) above, if the requirements of the national security of any High Contracting Party are, in His opinion, materially affected by the actual or authorised amount of construction by any Power of light surface vessels of sub-category (*b*), or of light surface vessels not conforming to the restrictions of paragraph (1) above, such High Contracting Party shall, upon notifying the other High Contracting Parties of His intentions and the reasons therefor, have the right to lay down or acquire light surface vessels of sub-categories (*a*) and (*b*) of any standard displacement up to 10,000 tons (10,610 metric tons) subject to the observance of the provisions of Part III of the present Treaty. Each of the other High Contracting Parties shall thereupon be entitled to exercise the same right.

(3) It is understood that the provisions of paragraph (1) above constitute no undertaking expressed or implied to continue the restrictions therein prescribed after the year 1942.

Article 7

No submarine shall exceed 2,000 tons (2,032 metric tons) standard displacement or carry a gun exceeding 5·1 in. (130 mm.) in calibre.

Article 8

Every vessel shall be rated at its standard displacement, as defined in Article 1A of the present Treaty.

Article 9

No preparations shall be made in merchant ships in time of peace for the installation of warlike armaments for the purpose of converting such ships into vessels of war, other than the necessary stiffening of decks for the mounting of guns not exceeding 6·1 in. (155 mm.) in calibre.

Article 10

Vessels which were laid down before the date of the coming into force of the present Treaty, the standard displacement or armament of which exceeds the limitations or restrictions prescribed in this Part of the present Treaty for their category or sub-category, or vessels which before that date were converted to target use exclusively or retained exclusively for experimental or training purposes under the provisions of previous treaties, shall retain the category or designation which applied to them before the said date.

PART III

ADVANCE NOTIFICATION AND EXCHANGE OF INFORMATION

Article 11

(1) Each of the High Contracting Parties shall communicate every year to each of the other High Contracting Parties information, as hereinafter provided, regarding His annual programme for the construction and acquisition of all vessels of the categories and sub-categories mentioned in Article 12 (*a*), whether or not the vessels concerned are constructed within His own jurisdiction, and periodical information giving details of such vessels and of any alterations to vessels of the said categories or sub-categories already completed.

(2) For the purposes of this and the succeeding Parts of the present Treaty, information shall be deemed to have reached a High Contracting Party on the date upon which such information is communicated to His Diplomatic Representatives accredited to the High Contracting Party by whom the information is given.

(3) This information shall be treated as confidential until published by the High Contracting Party supplying it.

Article 12

The information to be furnished under the preceding Article in respect of vessels constructed by or for a High Contracting Party shall be given as follows ; and so as to reach all the other High Contracting Parties within the periods or at the times mentioned :—

(*a*) Within the first four months of each calendar year, the Annual Programme of construction of all vessels of the following categories and sub-categories, stating the number of vessels of each category or sub-category and, for each vessel, the calibre of the largest gun. The categories and sub-categories in question are :—

- Capital Ships—
  - sub-category (*a*)
  - sub-category (*b*)
- Aircraft-Carriers—
  - sub-category (*a*)
  - sub-category (*b*)
- Light Surface Vessels—
  - sub-category (*a*)
  - sub-category (*b*)
  - sub-category (*c*)
- Submarines.

(*b*) Not less than four months before the date of the laying of the keel, the following particulars in respect of each such vessel :—

Name or designation ;
Category and sub-category ;
Standard displacement in tons and metric tons ;
Length at waterline at standard displacement ;
Extreme beam at or below waterline at standard displacement ;
Mean draught at standard displacement ;
Designed horse-power ;
Designed speed ;
Type of machinery ;
Type of fuel ;
Number and calibre of all guns of 3 in. (76 mm.) calibre and above ;
Approximate number of guns of less than 3 in. (76 mm.) calibre ;
Number of torpedo tubes ;
Whether designed to lay mines ;
Approximate number of aircraft for which provision is to be made.

(*c*) As soon as possible after the laying-down of the keel of each such vessel, the date on which it was laid.

(*d*) Within one month after the date of completion of each such vessel, the date of completion together with all the particulars specified in paragraph (*b*) above relating to the vessel on completion.

(*e*) Annually during the month of January, in respect of vessels belonging to the categories and sub-categories mentioned in paragraph (*a*) above :

(i) Information as to any important alterations which it may have proved necessary to make during the preceding year in vessels under construction, in so far as these alterations affect the particulars mentioned in paragraph (*b*) above.

(ii) Information as to any important alterations made during the preceding year in vessels previously completed, in so far as these alterations affect the particulars mentioned in paragraph (*b*) above.

(iii) Information concerning vessels which may have been scrapped or otherwise disposed of during the preceding year. If such vessels are not scrapped, sufficient information shall be given to enable their new status and condition to be determined.

(*f*) Not less than four months before undertaking such alterations as would cause a completed vessel to come within one of the categories or sub-categories mentioned in paragraph (*a*) above, or such alterations as would cause a vessel to change from one to another of the said categories or sub-categories : information as to her intended characteristics as specified in paragraph (*b*) above.

Article 13

No vessel coming within the categories or sub-categories mentioned in Article 12 (*a*) shall be laid down by any High Contracting Party until after the expiration of a period of four months both from the date on which the Annual Programme in which the vessel is included, and from the date on which the particulars in respect of that vessel prescribed by Article 12 (*b*), have reached all the other High Contracting Parties.

Article 14

If a High Contracting Party intends to acquire a completed or partially completed vessel coming within the categories or sub-categories mentioned in Article 12 (*a*), that vessel shall be declared at the same time and in the same manner as the vessels included in the Annual Programme prescribed in the said Article. No such vessel shall be acquired until after the expiration of a period of four months from the date on which such declaration has reached all the other High Contracting Parties. The particulars mentioned in Article 12 (*b*), together with the date on which the keel was laid, shall be furnished in respect of such vessel so as to reach all the other High Contracting Parties within one month after the date on which the contract for the acquisition of the vessel was signed. The particulars mentioned in Article 12 (*d*), (*e*) and (*f*) shall be given as therein prescribed.

Article 15

At the time of communicating the Annual Programme prescribed by Article 12 (*a*), each High Contracting Party shall inform all the other High Contracting Parties of all vessels included in His previous Annual Programmes and declarations that have not yet been laid down or acquired, but which it is the intention to lay down or acquire during the period covered by the first mentioned Annual Programme.

Article 16

If, before the keel of any vessel coming within the categories or sub-categories mentioned in Article 12 (*a*) is laid, any important modification is made in the particulars regarding her which have been communicated under Article 12 (*b*), information concerning this modification shall be given, and the laying of the keel shall be deferred until at least four months after this information has reached all the other High Contracting Parties.

Article 17

No High Contracting Party shall lay down or acquire any vessel of the categories or sub-categories mentioned in Article 12 (*a*), which has not previously been included in His Annual Programme of construction or declaration of acquisition for the current year or in any earlier Annual Programme or declaration.

Article 18

If the construction, modernisation or reconstruction of any vessel coming within the categories or sub-categories mentioned in Article 12 (*a*), which is for the order of a Power not a party to the present Treaty, is undertaken within the jurisdiction of any High Contracting Party, He shall promptly inform all the other High Contracting Parties of the date of the signing of the contract and shall also give as soon as possible in respect of the vessel all the information mentioned in Article 12 (*b*), (*c*) and (*d*).

Article 19

Each High Contracting Party shall give lists of all His minor war vessels and auxiliary vessels with their characteristics, as enumerated in Article 12 (*b*), and information as to the particular service for which they are intended, so as to reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty ; and, so as to reach all the other High Contracting Parties within the month of January in each subsequent year, any amendments in the lists and changes in the information.

Article 20

Each of the High Contracting Parties shall communicate to each of the other High Contracting Parties, so as to reach the latter within one month after the date of the coming into force of the present Treaty, particulars, as mentioned in Article 12 (*b*), of all vessels of the categories or sub-categories mentioned in Article 12 (*a*), which are then under construction for Him, whether or not such vessels are being constructed within His own jurisdiction, together with similar particulars relating to any such vessels then under construction within His own jurisdiction for a Power not a party to the present Treaty.

Article 21

(1) At the time of communicating His initial Annual Programme of construction and declaration of acquisition, each High Contracting Party shall inform each of the other High Contracting Parties of any vessels of the categories or sub-categories mentioned in Article 12 (*a*), which have been previously authorised and which it is the intention to lay down or acquire during the period covered. by the said Programme.

(2) Nothing in this Part of the present Treaty shall prevent any High Contracting Party from laying down or acquiring, at any time during the four months following the date of the coming into force of the Treaty, any vessel included, or to be included, in His initial Annual Programme of construction or declaration of acquisition, or previously authorised, provided that the information prescribed by Article 12 (*b*) concerning each vessel shall be communicated so as to reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty.

(3) If the present Treaty should not come into force before the 1st May, 1937, the initial Annual Programme of construction and declaration of acquisition, to be communicated under Articles 12 (*a*) and 14 shall reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty.

PART IV

GENERAL AND SAFEGUARDING CLAUSES

Article 22

No High Contracting Party shall, by gift, sale or any mode of transfer, dispose of any of His surface vessels of war or submarines in such a manner that such vessel may become a surface vessel of war or a submarine in any foreign navy. This provision shall not apply to auxiliary vessels.

Article 23

(1) Nothing in the present Treaty shall prejudice the right of any High Contracting Party, in the event of loss or accidental destruction of a vessel, before the vessel in question has become over-age, to replace such vessel by a vessel of the same category or sub-category as soon as the particulars of the new vessel mentioned in Article 12 (*b*) shall have reached all the other High Contracting Parties.

(2) The provisions of the preceding paragraph shall also govern the immediate replacement, in such circumstances, of a light surface vessel of sub-category (*b*) exceeding 8,000 tons (8,128 metric tons) standard displacement, or of a light surface vessel of sub-category (*a*), before the vessel in question has become over-age, by a light surface vessel of the same sub-category of any standard displacement up to 10,000 tons (10,160 metric tons).

Article 24

(1) If any High Contracting Party should become engaged in war, such High Contracting Party may, if He considers the naval requirements of His defence are materially affected, suspend, in so far as He is concerned, any or all of the obligations of the present Treaty, provided that He shall promptly notify the other High Contracting Parties that the circumstances require such suspension, and shall specify the obligations it is considered necessary to suspend.

(2) The other High Contracting Parties shall in such case promptly consult together, and shall examine the situation thus presented with a view to agreeing as to the obligations of the present Treaty, if any, which each of the said High Contracting Parties may suspend. Should such consultation not produce agreement, any of the said High Contracting Parties may suspend, in so far as He is concerned, any or all of the obligations of the present Treaty, provided that He shall promptly give notice to the other High Contracting Parties of the obligations which it is considered necessary to suspend.

(3) On the cessation of hostilities, the High Contracting Parties shall consult together with a view to fixing a date upon which the obligations of the Treaty which have been suspended shall again become operative, and to agreeing upon any amendments in the present Treaty which may be considered necessary.

Article 25

(1) In the event of any vessel not in conformity with the limitations and restrictions as to standard displacement and armament prescribed by Articles 4, 5 and 7 of the present Treaty being authorised, constructed or acquired by a Power not a party to the present Treaty, each High Contracting Party reserves the right to depart if, and to the extent to which, He considers such departures necessary in order to meet the requirements of His national security ;

(*a*) during the remaining period of the Treaty, from the limitations and restrictions of Articles 3, 4, 5, 6 (1) and 7, and

(*b*) during the current year, from His Annual Programmes of construction and declarations of acquisition.

This right shall be exercised in accordance with the following provisions :—

(2) Any High Contracting Party who considers it necessary that such right should be exercised, shall notify the other High Con-

tracting Parties to that effect, stating precisely the nature and extent of the proposed departures and the reasons therefor.

(3). The High Contracting Parties shall thereupon consult together and endeavour to reach an agreement with a view to reducing to a minimum the extent of the departures which may be made.

(4) On the expiration of a period of three months from the date of the first of any notifications which may have been given under paragraph (2) above, each of the High Contracting Parties shall, subject to any agreement which may have been reached to the contrary, be entitled to depart during the remaining period of the present Treaty from the limitations and restrictions prescribed in Articles 3, 4, 5, 6 (1) and 7 thereof.

(5) On the expiration of the period mentioned in the preceding paragraph, any High Contracting Party shall be at liberty, subject to any agreement which may have been reached during the consultations provided for in paragraph (3) above, and on informing all the other High Contracting Parties, to depart from His Annual Programmes of construction and declarations of acquisition and to alter the characteristics of any vessels building or which have already appeared in His Programmes or declarations.

(6) In such event, no delay in the acquisition, the laying of the keel, or the altering of any vessel shall be necessary by reason of any of the provisions of Part III of the present Treaty. The particulars mentioned in Article 12 (*b*) shall, however, be communicated to all the other High Contracting Parties before the keels of any vessels are laid. In the case of acquisition, information relating to the vessel shall be given under the provisions of Article 14.

Article 26

(1) If the requirements of the national security of any High Contracting Party should, in His opinion, be materially affected by any change of circumstances, other than those provided for in Articles 6 (2), 24 and 25 of the present Treaty, such High Contracting Party shall have the right to depart for the current year from His Annual Programmes of construction and declarations of acquisition. The amount of construction by any Party to the Treaty, within the limitations and restrictions thereof, shall not, however, constitute a change of circumstances for the purposes of the present Article. The above mentioned right shall be exercised in accordance with the following provisions :—

(2) Such High Contracting Party shall, if He desires to exercise the above mentioned right, notify all the other High Contracting Parties to that effect, stating in what respects He proposes to depart from His Annual Programmes of construction and declarations of acquisition, giving reasons for the proposed departure.

(3) The High Contracting Parties will thereupon consult together with a view to agreement as to whether any departures are necessary in order to meet the situation.

(4) On the expiration of a period of three months from the date

of the first of any notifications which may have been given under paragraph (2) above, each of the High Contracting Parties shall, subject to any agreement which may have been reached to the contrary, be entitled to depart from His Annual Programmes of construction and declarations of acquisition, provided notice is promptly given to the other High Contracting Parties stating precisely in what respects He proposes so to depart.

(5) In such event, no delay in the acquisition, the laying of the keel, or the altering of any vessel shall be necessary by reason of any of the provisions of Part III of the present Treaty. The particulars mentioned in Article 12 (*b*) shall, however, be communicated to all the other High Contracting Parties before the keels of any vessels are laid. In the case of acquisition, information relating to the vessel shall be given under the provisions of Article 14.

PART V

FINAL CLAUSES

Article 27

The present Treaty shall remain in force until the 31st December, 1942.

Article 28

(1) His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland will, during the last quarter of 1940, initiate through the diplomatic channel a consultation between the Governments of the Parties to the present Treaty with a view to holding a conference in order to frame a new treaty for the reduction and limitation of naval armament. This conference shall take place in 1941 unless the preliminary consultations should have shown that the holding of such a conference at that time would not be desirable or practicable.

(2) In the course of the consultation referred to in the preceding paragraph, views shall be exchanged in order to determine whether, in the light of the circumstances then prevailing and the experience gained in the interval in the design and construction of capital ships, it may be possible to agree upon a reduction in the standard displacement or calibre of guns of capital ships to be constructed under future annual programmes and thus, if possible, to bring about a reduction in the cost of capital ships.

Article 29

None of the provisions of the present Treaty shall constitute a precedent for any future treaty.

Article 30

(1) The present Treaty shall be ratified by the Signatory Powers in accordance with their respective constitutional methods, and the

instruments of ratification shall be deposited as soon as possible with His Majesty's Government in the United Kingdom, which will transmit certified copies of all the *procès-verbaux* of the deposits of ratifications to the Governments of the said Powers and of any country on behalf of which accession has been made in accordance with the provisions of Article 31.

(2) The Treaty shall come into force on the 1st January, 1937, provided that by that date the instruments of ratification of all the said Powers shall have been deposited. If all the above-mentioned instruments of ratification have not been deposited by the 1st January, 1937, the Treaty shall come into force so soon thereafter as these are all received.

Article 31

(1) The present Treaty shall, at any time after this day's date, be open to accession on behalf of any country for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on the 22nd April, 1930, but for which the present Treaty has not been signed. The instrument of accession shall be deposited with His Majesty's Government in the United Kingdom, which will transmit certified copies of the *procès-verbaux* of the deposit to the Governments of the Signatory Powers and of any country on behalf of which accession has been made.

(2) Accessions, if made prior to the date of the coming into force of the Treaty, shall take effect on that date. If made afterwards, they shall take effect immediately.

(3) If accession should be made after the date of the coming into force of the Treaty, the following information shall be given by the acceding Power so as to reach all the other High Contracting Parties within one month after the date of accession :—

(*a*) The initial Annual Programme of construction and declaration of acquisition, as prescribed by Articles 12 (*a*) and 14, relating to vessels already authorised, but not yet laid down or acquired, belonging to the categories or sub-categories mentioned in Article 12 (*a*).

(*b*) A list of the vessels of the above-mentioned categories or sub-categories completed or acquired after the date of the coming into force of the present Treaty, stating particulars of such vessels as specified in Article 12 (*b*), together with similar particulars relating to any such vessels which have been constructed within the jurisdiction of the acceding Power after the date of the coming into force of the present Treaty, for a Power not a party thereto.

(*c*) Particulars, as specified in Article 12 (*b*), of all vessels of the categories or sub-categories above-mentioned which are then under construction for the acceding Power, whether or not such vessels are being constructed within His own jurisdiction, together with similar particulars relating to any such vessels then under construction within His jurisdiction for a Power not a party to the present Treaty.

(*d*) Lists of all minor war vessels and auxiliary vessels with their characteristics and information concerning them, as prescribed by Article 19.

(4) Each of the High Contracting Parties shall reciprocally furnish to the Government of any country on behalf of which accession is made after the date of the coming into force of the present Treaty, the information specified in paragraph (3) above, so as to reach that Government within the period therein mentioned.

(5) Nothing in Part III of the present Treaty shall prevent an acceding Power from laying down or acquiring, at any time during the four months following the date of accession, any vessel included, or to be included, in His initial Annual Programme of construction or declaration of acquisition, or previously authorised, provided that the information prescribed by Article 12 (*b*) concerning each vessel shall be communicated so as to reach all the other High Contracting Parties within one month after the date of accession.

Article 32

The present Treaty, of which the French and English texts shall both be equally authentic, shall be deposited in the Archives of His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland which will transmit certified copies thereof to the Governments of the countries for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on the 22nd April, 1930.

In faith whereof the above-named Plenipotentiaries have signed the present Treaty and have affixed thereto their seals.

Done in London the 25th day of March, nineteen hundred and thirty-six.

PROTOCOL OF SIGNATURE.

At the moment of signing the Treaty bearing this day's date, the undersigned, duly authorised to that effect by their respective Governments, have agreed as follows :—

1. If, before the coming into force of the above-mentioned Treaty, the naval construction of any Power, or any change of circumstances, should appear likely to render undesirable the coming into force of the Treaty in its present form, the Powers on behalf of which the Treaty has been signed will consult as to whether it is desirable to modify any of its terms to meet the situation thus presented.
2. In the event of the Treaty not coming into force on the 1st January, 1937, the above-mentioned Powers will, as a temporary measure, promptly communicate to one another, after the laying down, acquisition or completion of any vessels in the categories or sub-categories mentioned in Article 12 (*a*) of the Treaty, the information detailed below concerning all such vessels laid down between the 1st January, 1937 and the date of

the coming into force of the Treaty, provided, however, that this obligation shall not continue after 1st July, 1937 :—

Name or designation ;
Classification of the vessel ;
Standard displacement in tons and metric tons ;
Principal dimensions at standard displacement, namely length at waterline and extreme beam at or below waterline ;
Mean draught at standard displacement ;
Calibre of the largest gun.

3. The present Protocol, of which the French and English texts shall both be equally authentic, shall come into force on this day's date. It shall be deposited in the archives of His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland which will transmit certified copies thereof to the Governments of the countries for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on the 22nd April, 1930.

In faith whereof the above-named Plenipotentiaries have signed the present Protocol and have affixed thereto their seals.

Done in London the 25th day of March, nineteen hundred and thirty-six.

ADDITIONAL PROTOCOL.

The undersigned Plenipotentiaries express the hope that the system of Advance Notification and Exchange of Information will be continued by international agreement after the expiration of the Treaty bearing this day's date, and that it may be possible in any future Treaty to achieve some further measure of reduction in naval armament.

Done in London the 25th day of March, nineteen hundred and thirty-six.

MEMORANDUM ON THE LONDON NAVAL CONFERENCE,

DECEMBER 9, 1935, TO MARCH 25, 1936.

THE following Memorandum was issued as a White Paper (Miscellaneous No. 2, 1936, Cmd. 5137) at the time of the signing of the new London Naval Treaty :—

Under the provisions of the London Naval Treaty, 1930,* the High Contracting Powers agreed to meet in conference in 1935 to frame a new agreement to replace and carry out the purposes of the existing treaty. His Majesty's Government in the United Kingdom therefore initiated early in 1934 the preliminary conversations which experience has shown to be essential to the success of an international conference of this nature.

2. On the 29th December, 1934, notice of termination of the Washington Treaty was given by Japan. As the Contracting Powers to that Treaty † had agreed to meet in conference within one year of the date of such notice of termination, it was, for this reason also, necessary to summon a conference in 1935. His Majesty's Government in the United Kingdom, feeling that as they had taken the initiative in the preparatory conversations they were perhaps under a greater obligation in the matter than other Governments, accordingly issued the necessary invitations.

3. The Conference was opened on Monday, the 9th December, 1935, by the Prime Minister, who stated that the proposals of this country remained the same as those communicated by His Majesty's Government to the Disarmament Conference in July, 1932, and that they attached the greatest importance to a continuation of limitation in both the quantitative and qualitative field. He pointed out that an international agreement on these lines would undoubtedly lead to great economy in future naval construction throughout the world. He also expressed the hope that, even if the abolition of submarines should prove impossible, the acceptance by France and Italy of the rules laid down in Part IV of the London Naval Treaty, 1930, would be the signal for the acceptance of those rules by all the maritime Powers of the world, and that by this means unrestricted submarine warfare would in future be averted.

4. As regards quantitative limitation, His Majesty's Government were forced to the conclusion during the preliminary conversations that agreement on any system of limitation based directly on

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* Cmd. 3758.

† Cmd. 2036.

a " ratio " or definite relationship of naval strength, such as that on which the Washington and London Naval Treaties were founded, would prove difficult of attainment. In order to preserve some measure of quantitative limitation they proposed as a " middle way " that the quantitative side of the Treaty should consist of unilateral and voluntary declarations by each of the signatory Powers limiting its construction over a period of, say, six years.

They realised that the degree to which their proposal would effect a quantitative limitation in naval armaments would depend entirely on the spirit in which it was carried out, but they would have been fully prepared to give to such construction figures as might be agreed upon the form of a contractual obligation, if that method of limitation had been acceptable to other Powers.

Agreement on any form of quantitative limitation has, however, unfortunately not been possible.

5. At the opening of the Conference Japan tabled her proposal for a " Common Upper Limit." After considerable discussion this proposal remained unacceptable to all the other delegations, and to the deep regret of His Majesty's Government Japan withdrew her delegation from the Conference, leaving however observers to watch its progress.

6. The United Kingdom proposals mentioned above having also proved unacceptable generally, the further efforts of the Conference were directed to achieving the maximum measure possible of qualitative limitation, and to obtaining agreement on provisions for advanced notification of construction or acquisition of war vessels, and to exchange of information on their principal characteristics. The object of this latter provision is to remove one of the most fruitful sources of suspicion between Naval Powers, thus reducing the likelihood of building competition between them.

Complete agreement has been reached between the Members of the British Commonwealth of Nations possessing sea-going naval forces, the United States of America and France on these points. Although Italy has found herself unable for the present to associate herself with this agreement, the Italian delegation entered fully into all the discussions, was consulted on all points, and, subject to certain reservations, agreed to the wording of the various reports.

7. As regards qualitative limitation, it will be convenient to place before Parliament a comparison of the aims of His Majesty's Government with the results actually achieved by the Conference.

Limitations proposed by His Majesty's Government to the Disarmament Conference, 1932, *which were again put forward at the present Conference.*			*Limitations agreed to in The London Naval Treaty,* 1936.		
	Maximum Displacement. Tons.	*Maximum Gun Calibre.*		*Maximum Displacement. Tons.*	*Maximum Gun Calibre.*
Capital Ships . . . (assuming the retention of the 8-in. Cruiser)	25,000	12-in.	Capital Ships . . .	35,000	14-in.(¹)
Aircraft Carriers . .	22,000	6·1-in.	Aircraft Carriers . .	23,000	6·1-in.
Cruisers—			Light Surface Vessels(²)—		
Category (*a*) . . *i.e.*, 10,000 tons—8-in. guns.	No further construction.		Sub-category (*a*) . (Corresponding to Cruiser category (*a*)).	No further construction during the period of the Treaty.	
Category (*b*) . . . *i.e.*, 10,000 tons—6-in. guns.	7,000	6·1-in.	Sub-category (*b*) . (Corresponding generally to Cruiser category (*b*)).		
Destroyers—			For the period of the Treaty, agreement has been obtained to a " Holiday " in the building of Light Surface Vessels Sub-category (*b*), up to the full limits that would be possible within the definition of the sub-category, *i.e.*, 10,000 tons and 6·1-in. guns and the limits allowed are	8,000	6·1-in.
Leaders	1,850	5·1-in.			
Destroyers . . .	1,500				
Submarines—			Submarines . . .	2,000	5·1-in.
Abolition, or, failing this	250				

(¹) Provided that if any of the Washington Powers fail to accept this provision before 1st April, 1937, the maximum gun calibre shall be 16-in.

(²) It will be observed that Cruisers, Leaders and Destroyers are now classed together under the name of Light Surface Vessels. This has been done to meet the wishes of other Powers, none of whom except the U.S.A. and Japan have ever accepted a separate Leader and Destroyer category.

8. As regards capital ships, although agreement on reduction of the Washington tonnage has not been found possible, the reduction in calibre of gun is a satisfactory step and may lead to future agreement on reductions in tonnage, and possibly to gradual further reductions in calibre.

This reduction in gun calibre is, as before stated, subject to the provision that, if any of the Washington Powers fail to agree to it before the 1st April, 1937, the maximum gun calibre shall remain at 16-inch.

9. As regards aircraft carriers, the reduction to 23,000 tons from the Washington limit of 27,000 tons is considerable, and will result initially in appreciable financial saving in the building of this expensive class of warship, although against this saving must be offset the increased expense in the long run of embarking a similar number of aircraft in smaller carriers.

10. As regards light surface vessels, His Majesty's Government are very gratified that their desire permanently to reduce the size of cruisers has resulted in the adoption of a " Holiday " in the building of all large cruisers, whether of sub-category (*a*) and armed with the 8-inch gun, or of sub-category (*b*) of a size larger than 8,000-tons, and armed with guns of a calibre not greater than 6·1-inch. In view of our commitments, both in respect of replacement of old wartime cruisers and of the essential steady increase in numbers, this will result in substantial reductions in expenditure.

11. The limitations on light surface vessels (Cruisers, Destroyers, etc.), are made effective by agreement on a " zone of non-construction " within which no ships may be built. If this had not been done, vessels could have been built which by definition would have been capital ships, but which in reality could have been of a superior cruiser type.

The " zone " extends from 8,000 to 17,500 tons and the necessary corollary has been a corresponding limitation on the minimum size of gun to be carried by a capital ship, which is fixed at 10 inches.

In order to prevent a vessel which would upset the intentions of the Treaty being built in the guise of an aircraft carrier, provision has also been made to limit to ten the number of guns of above 5·25-inch calibre carried by those vessels.

12. As regards submarines, it has again not been found possible to reach agreement on the policy of abolition and the London Naval Treaty limits for this category have been retained.

13. As regards Advance Notification of Construction or Acquisition of Warships, the provisions now made are entirely new. Under neither the Washington nor the London Naval Treaty were there any arrangements of this nature.

As regards Exchange of Information, not only is this to take place earlier in the life of each ship building or acquired than was provided for in those Treaties, but the scope of the information is considerably extended. The main provisions are that :—

(*a*) The High Contracting Parties will communicate to each other within the first four months of each calendar year their annual programme of construction or acquisition of the principal classes of warship, giving the calibre of the largest gun carried by each vessel.

Once these programmes are declared, no increase in the number of vessels included in the declaration is permitted for the current year, subject, of course, to the operation of the various safeguarding clauses.

No vessel of the principal classes of warship can be laid down until after the lapse of four months from the date of communication of the above programme.

(*b*) Full information as to characteristics of each vessel is to be given at least four months before the ship is laid down.

Arrangements are also made to provide for exchange of information concerning necessary departures during building from the characteristics already reported, details of ships scrapped or otherwise disposed of, particulars of ships acquired, important alterations in vessels previously completed, and various other matters.

14. As regards various other classes of ships which were not sufficiently important to be included in the above procedure and which, under the London Naval Treaty, 1930, were classified as Exempt or Special vessels, arrangements have been made whereby they are now classed as " Auxiliary Vessels " or as " Minor War Vessels." These vessels will not be subject to the provisions of Advance Notification of Construction or Acquisition, but lists of them will be exchanged and kept up to date annually.

15. All information exchanged will, of course, necessarily be treated as confidential until published by the High Contracting Party supplying it.

16. As regards safeguarding clauses, careful arrangements have been made to deal with the three principal sets of circumstances in which the release of a Contracting Party from the provisions of the Treaty might be necessary, namely, should a Contracting Party become engaged in a war and consider the naval requirements of his security to be materially affected ; should a Power not signatory to the Treaty acquire, or propose to acquire, vessels not in conformity with the limitations and restrictions of the Treaty ; or should a High Contracting Party's national security be materially affected by any change of circumstances other than those mentioned above, or below, in respect of the " Cruiser Holiday." In all the above cases consultation between the High Contracting Parties is required and three months' delay is imposed before departing from the obligations of the Treaty, except in the case where one such Party becomes engaged in war, when he can suspend any or all of the obligations at once, and the other Parties can, after consultation, also forthwith suspend them.

17. A special and limited safeguard has also been provided in respect of the " Cruiser Holiday " in the article dealing with that " Holiday." This safeguard provides for a High Contracting Party, should he consider his national security to be affected, an escape against the amount of construction by any Power of cruisers of sub-category (*b*) and against the construction by a Non-Contracting Party of light surface vessels not allowed to be built under the terms of the " Holiday."

18. The Treaty will come into force on the 1st January, 1937, provided by that date it is ratified by all the signatory Powers, or, failing this, on the date by which it is ratified by these Powers. It

will of course be open to accession by Japan and Italy as signatories of the Washington Treaty. Negotiations have already commenced for the conclusion of a bilateral agreement on the same lines with Germany, and it is hoped that similar negotiations for bilateral agreements with certain other Naval Powers will be undertaken shortly.

As a first step towards the acceptance of a general Treaty on the same lines by all Naval Powers, the Conference, in communicating the Treaty to the League of Nations, has suggested that the remarks of other Naval Powers should in the first instance be forwarded to His Majesty's Government.

The Treaty will remain in force until the 31st December, 1942.

As regards arrangements for framing a further Treaty to come into force after that date, provision is made for His Majesty's Government in the United Kingdom to initiate, during the last quarter of 1940, a consultation between the Parties. Unless, as a result of consultation, it appears that it would be neither desirable nor practicable, a conference will be held in 1941. In the course of the consultation views will be exchanged to determine whether, amongst other points, it may be possible to agree upon a reduction in the calibre of gun and in the size of future capital ships.

19. The full extent of reduction and limitation aimed at by His Majesty's Government has by no means been achieved. A substantial measure of success has, however, been accomplished. Although agreement on any form of quantitative limitation has not proved possible, His Majesty's Government feel that, even if agreement to stand on the qualitative limits of the Washington and London Naval Treaties had been the only outcome of the conference, a very considerable success would have been recorded.

20. The principal capital ship fleets of the world will shortly be in process of renewal, a steady increase in cruiser strength can no longer be postponed in our own case, whilst in other classes of ships much new construction is required in place of war-time and obsolescent vessels. If no Treaty had been negotiated to replace those of Washington and London, there would have been complete freedom to build up to any size of ship desired, with the resulting increase of expenditure. Not only, however, has this been avoided, but the reductions in displacement and calibre of gun that have been agreed to, although not so drastic as His Majesty's Government had hoped, are in themselves sufficient to ensure considerable financial saving in our future naval construction programmes. Furthermore, the agreement should go far to put into effect the hopes expressed by the Prime Minister at the opening of the Conference, that the public mind will be relieved of the threat of a general race in naval armaments. The arrangements made for advance notification and exchange of information should do much to help in achieving this object, and the avoidance of secret building, with the inevitable suspicion which results from it, should materially assist in reinforcing international goodwill.

21. The Rules regarding submarine warfare contained in Part IV

of the London Naval Treaty, 1930, had already been accepted and become binding upon all the Members of the British Commonwealth of Nations, the United States of America and Japan as a result of their ratification of the above Treaty. The Rules had not, however, become binding upon France and Italy, owing to the fact that, though the Treaty was signed in respect of these countries, they had not ratified it, and in consequence it was not possible, as had been contemplated in the Treaty, for His Majesty's Government in the United Kingdom to communicate the Rules to countries in respect of which the Treaty had not been signed. France and Italy have now indicated their desire to confirm their acceptance of the above Rules resulting from the signature of the previous London Naval Treaty, and a separate instrument has been prepared, which it is hoped will shortly be signed, embodying the French and Italian confirmation of their previous acceptance of the Rules and authorising His Majesty's Government in the United Kingdom to communicate the Rules, which are a continuing obligation and not one for a short term only, to all other maritime countries, with an invitation to accede thereto and without limit of time.

March 25, 1936.

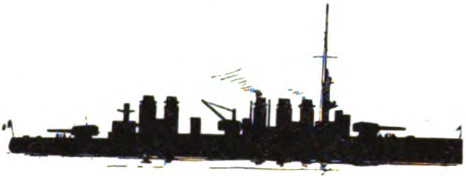
PROFILES OF
BRITISH AND FOREIGN WARSHIPS

1

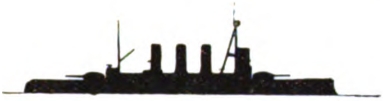
CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance **with the number of funnels and masts,** as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 193–234. All the profiles are drawn to the scale $\frac{1}{2}$ in. = 100 ft.]

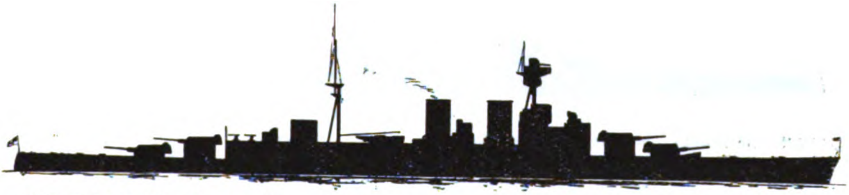
[Indexes to the names of vessels of which profiles are included in this section are given at the end of the volume.]



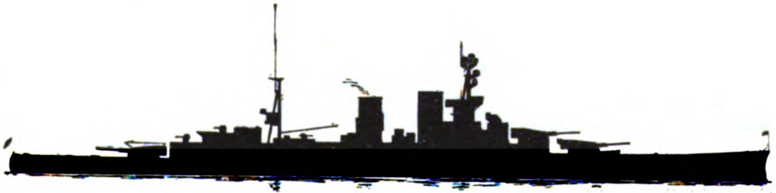
FRANCE. Battleships. Condorcet, Diderot, Voltaire.
(Diderot has a tall mainmast.)



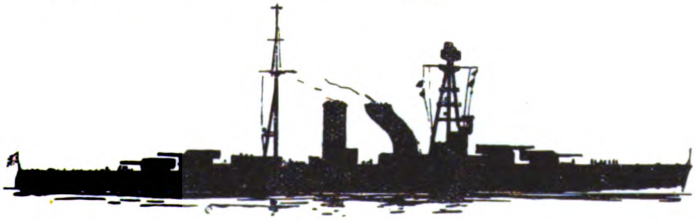
SWEDEN. Battleship. Oscar II.



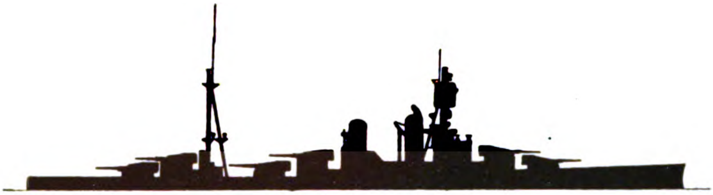
GREAT BRITAIN. Battle-cruiser. Hood.



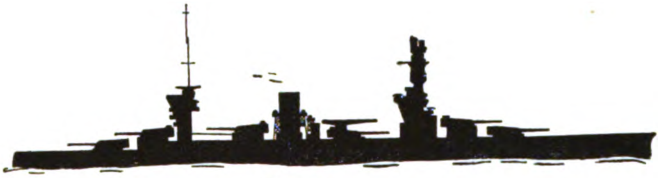
GREAT BRITAIN. Battle-cruisers. Renown, Repulse.



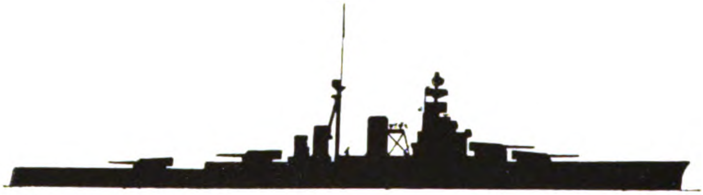
JAPAN. Battleships. Mutsu, Nagato.



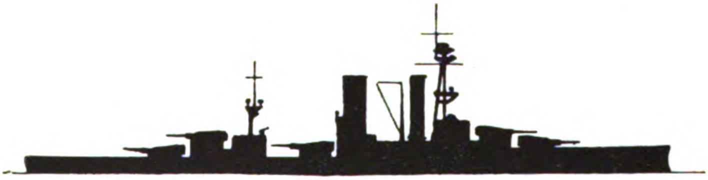
JAPAN. Battleships. Ise, Hyuga.



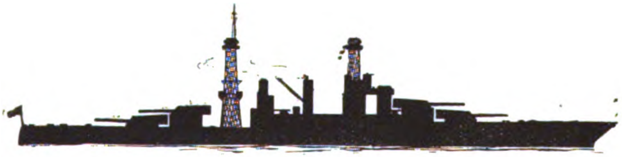
JAPAN. Battleships. Fuzo and Yamashiro.
(After reconstruction, 1934.)



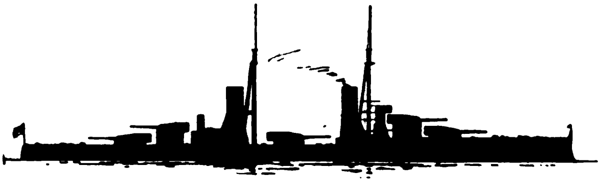
JAPAN. Battleships. Haruna, Kirishima, Kongo.



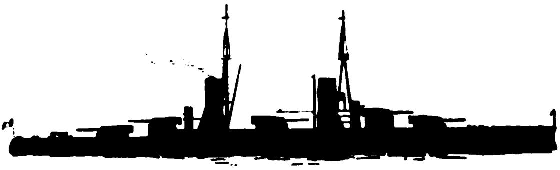
CHILE. Battleship. Almirante Latorre.
(Modernised 1931—mainmast raised and bridge work altered.)



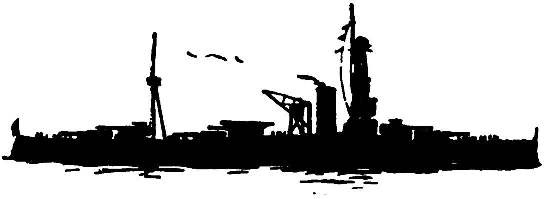
UNITED STATES. Battleships. California, Colorado, Maryland, Tennessee, West Virginia.
(Now fitted with 2 catapults, one on "X" turret and one on the quarter deck.)



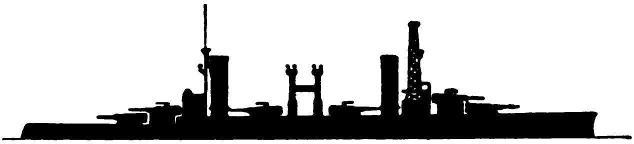
ITALY. Battleships. Andrea Doria, Caio Duilio.



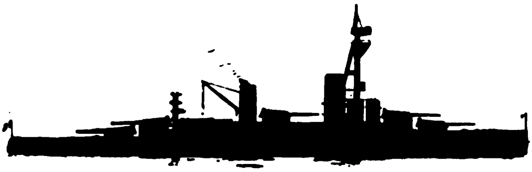
ITALY. Battleships. Conte di Cavour, Giulio Cesare.



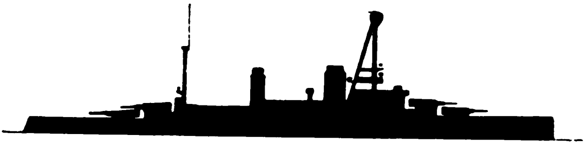
UNITED STATES. Battleship. Arkansas.



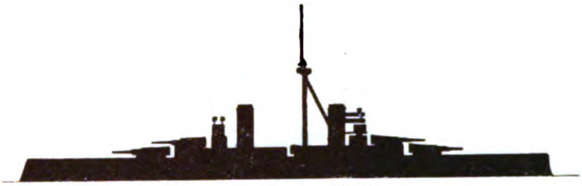
ARGENTINE. Battleships. Moreno, Rivadavia.



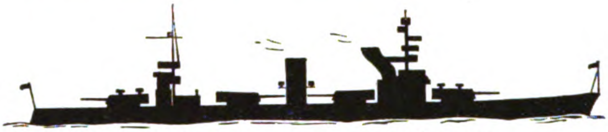
FRANCE. Battleships. Bretagne, Lorraine, Provence.
(Now have tall maintopmasts and no foretopmasts.)



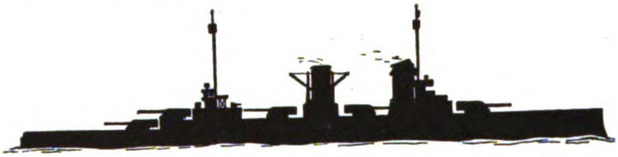
FRANCE. Battleships. Courbet, Jean Bart, Paris.



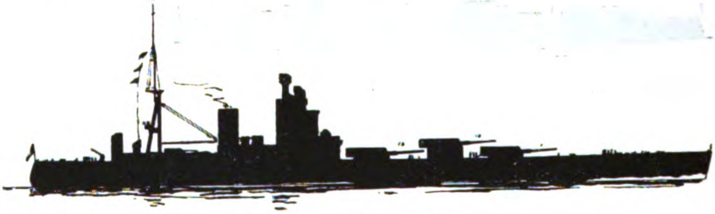
BRAZIL. Battleships. Minas Geraes, São Paulo.



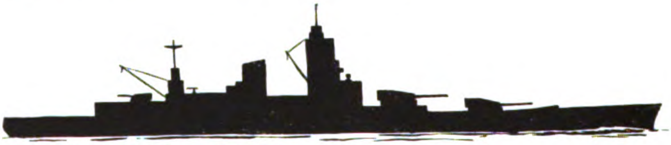
SOVIET UNION. Battleships. Marat and Paris Commune.



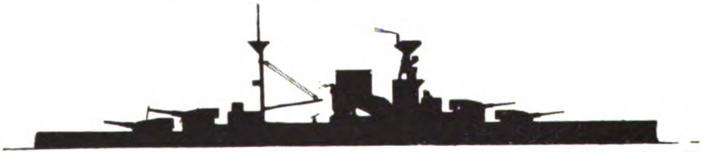
TURKEY. Battle-cruiser. Yavouz Sultan Selim.



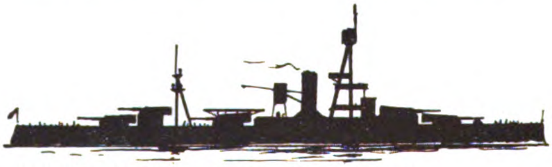
GREAT BRITAIN. Battleships. Nelson, Rodney.



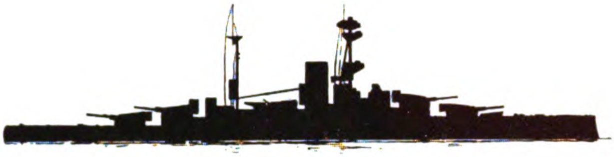
FRANCE. Battleship. Dunkerque.



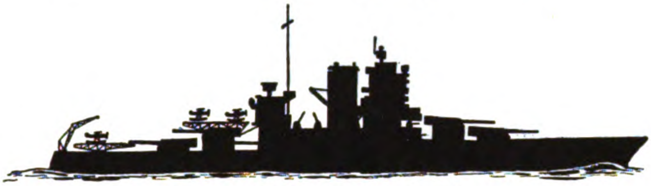
GREAT BRITAIN. Battleships. Queen Elizabeth, Warspite, Barham, Valiant, Malaya.



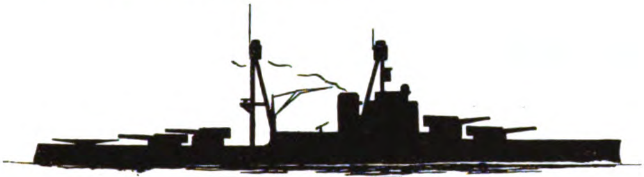
UNITED STATES. Battleships. New York, Texas.



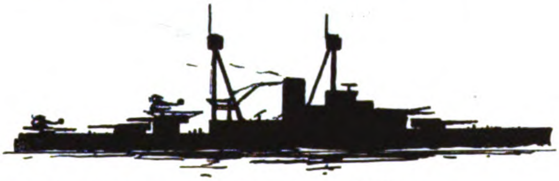
GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Oak, Royal Sovereign.



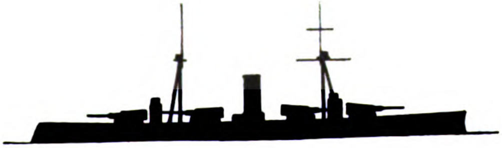
UNITED STATES. Battleships. Idaho, Mississippi.
(After modernisation, 1934.)



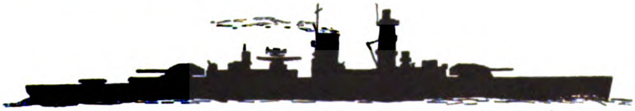
UNITED STATES. Battleships. Arizona, Pennsylvania.



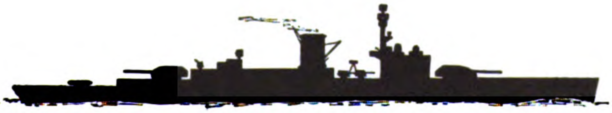
UNITED STATES. Battleships. Nevada, Oklahoma.



SPAIN. Battleship. Jaime I.

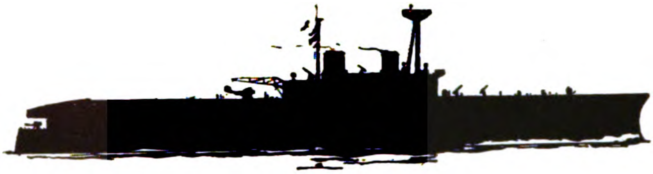


GERMANY. Armoured Ships. Admiral Scheer, Admiral Graf Spee.

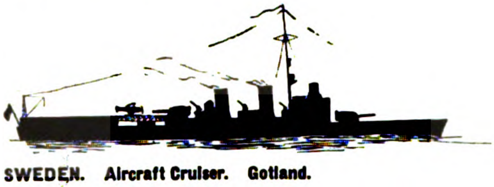


GERMANY. Armoured Ship. Deutschland.

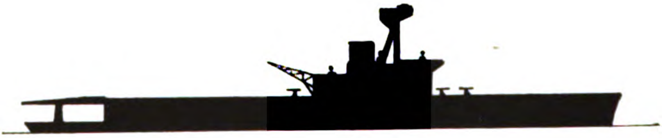
AIRCRAFT AND SEAPLANE CARRIERS AND TENDERS.



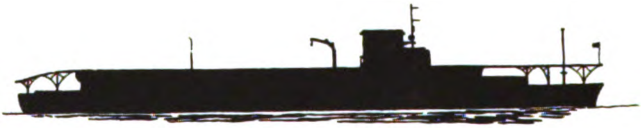
GREAT BRITAIN. Aircraft Carrier. Eagle.



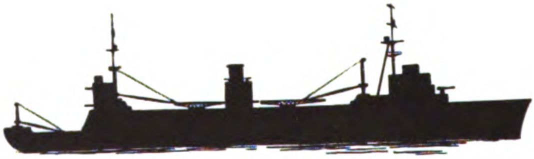
SWEDEN. Aircraft Cruiser. Gotland.



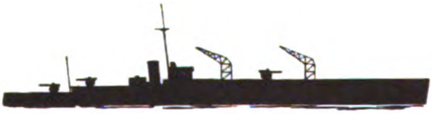
GREAT BRITAIN. Aircraft Carrier. Hermes.



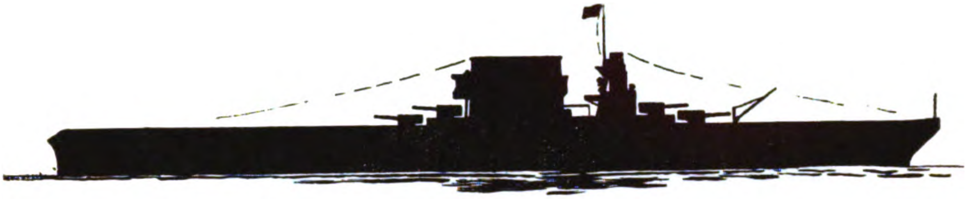
FRANCE. Aircraft Carrier. Béarn.



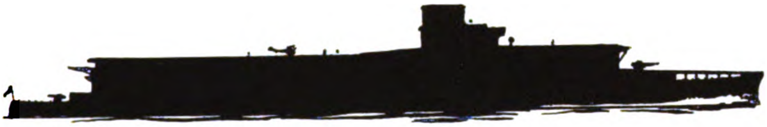
FRANCE. Aviation Transport. Commandant Teste.



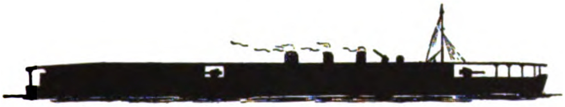
ROYAL AUSTRALIAN NAVY. Seaplane Carrier. Albatross.



UNITED STATES. Aircraft Carriers. Saratoga, Lexington.

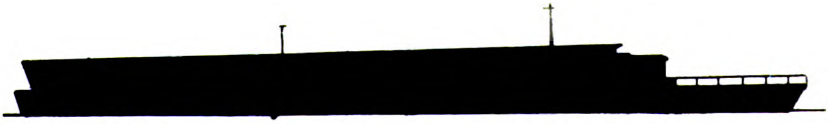


GREAT BRITAIN. Aircraft Carriers. Courageous, Glorious.



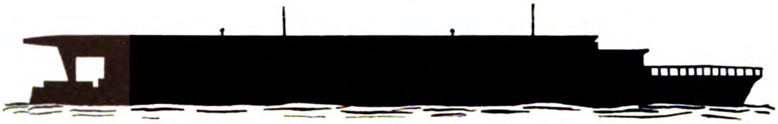
JAPAN. Aircraft Carrier. Hosho.

GREAT BRITAIN. Aircraft Carrier. Furious.

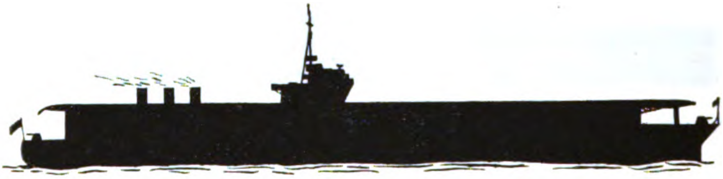


JAPAN. Aircraft Carrier. Akagi.

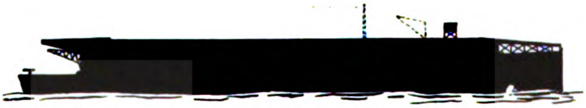
AIRCRAFT CARRIERS.



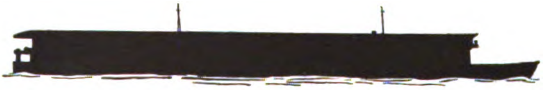
JAPAN. Aircraft Carrier. Kaga.



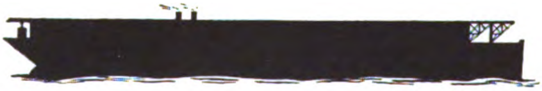
UNITED STATES. Aircraft Carrier Ranger
(NOTE.—Funnels hinge outboard.)



GREAT BRITAIN. Aircraft Carrier. Argus.

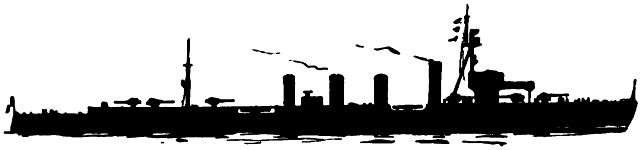


JAPAN. Aircraft Carrier. Ryujo.

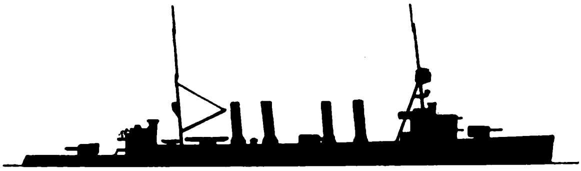


UNITED STATES. Aircraft Carrier. Langley.

CRUISERS AND COAST DEFENCE SHIPS.

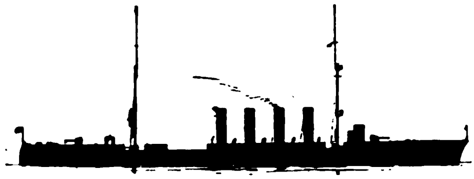


JAPAN. Cruisers. ("Sendai" class.) Naka, Sendai, Jintsu.

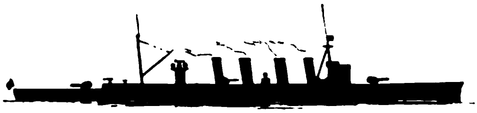


UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.

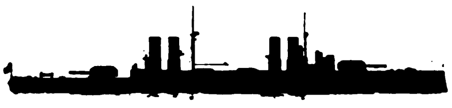
(There are small differences in the arrangement of guns aft.)



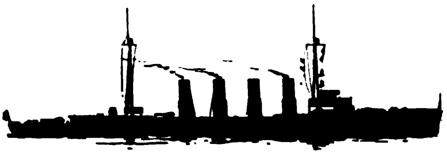
JAPAN. Cruisers. ("Chikuma" class.) Hirado, Yahagi.



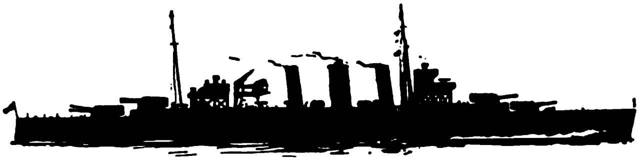
ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.



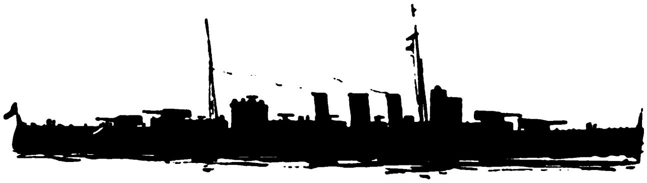
ITALY. Armoured Cruisers. (Classified as Battleships, 2nd class, in Italian official lists.) San Giorgio, San Marco.



ITALY. Light Cruiser. Taranto (*ex-German* Strassburg).

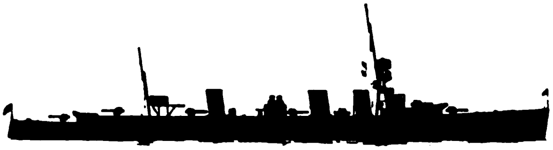


GREAT BRITAIN. Cruisers. ("London" class.) Devonshire, London, Shropshire, Sussex. ("Norfolk" class.) Dorsetshire, Norfolk.

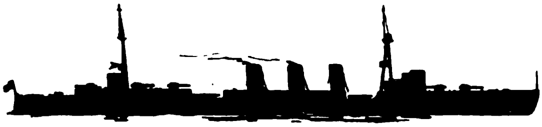


GREAT BRITAIN. Cruisers. ("Kent" class.) Berwick, Cornwall, Cumberland, Kent, Suffolk.

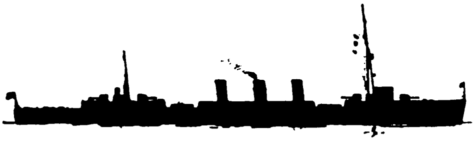
COMMONWEALTH OF AUSTRALIA. Cruisers. ("Kent" class.) Australia, Canberra.



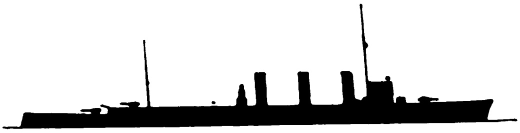
GREAT BRITAIN. Cruisers. ("E" class.) Emerald, Enterprise.
(In **Enterprise** the forward 6-in. guns are in a twin mounting on the forecastle deck.)



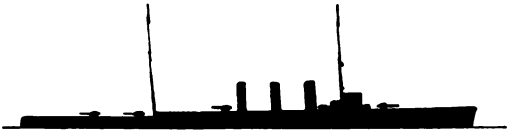
JAPAN. Light Cruisers. ("Kuma" class.) Kiso, Kitakami, Kuma, Oi, Tama. ("Natori" class.) Isudzu, *Natori, *Nagara, *Yura, *Kinu, *Abukuma.
* Has aircraft hangar incorporated in bridge structure.



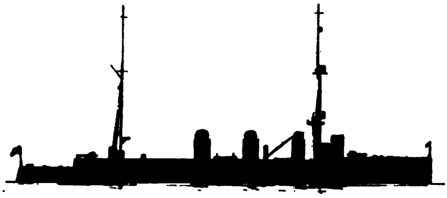
JAPAN. Light Cruisers. ("Tenryu" class.) Tatsuta, Tenryu.



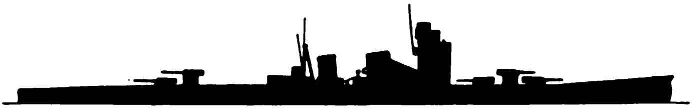
SPAIN. Light Cruiser. Mendez Nuñez.



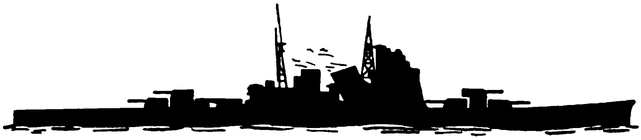
SPAIN. Light Cruiser. Republica.



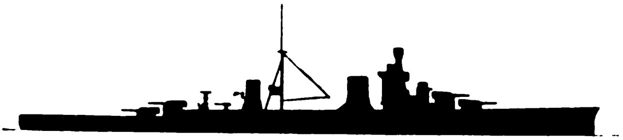
ITALY. Scout Cruiser. Quarto.



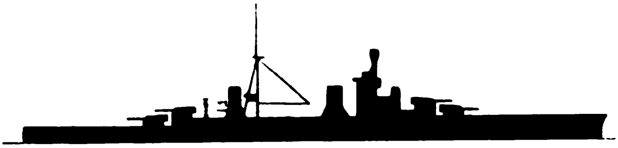
JAPAN. Cruisers. (" Nachi " class.) Nachi, Myoko, Ashigara, Haguro.



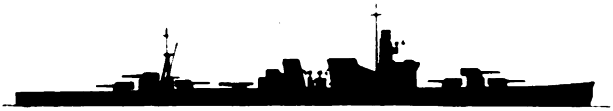
JAPAN. Cruisers. ("Takao" class.) Takao, Atago, Chokai, Maya.



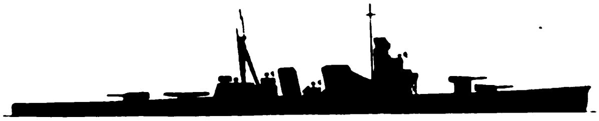
ITALY. Cruiser. (Modified " Trento " class.) Bolzano.



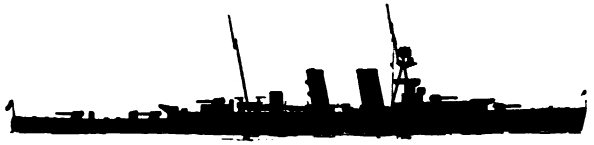
ITALY. Cruisers. ("Zara" class.) Pola, Zara, Fiume, Gorizia.



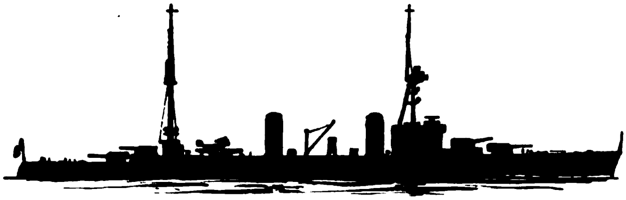
JAPAN. Cruisers. (" Furutaka " class.) Furutaka, Kato.
(The tops of the funnels are square to the funnels.)



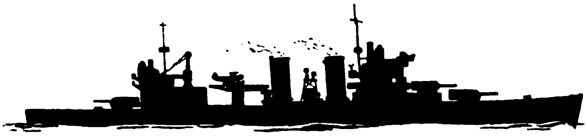
JAPAN. Cruisers. (" Furutaka " class.) Aoba, Kinugasa.
(The tops of the funnels are square to the funnels.)



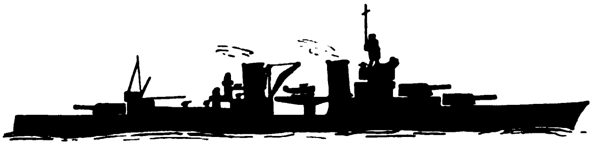
GREAT BRITAIN. Cruisers. (Improved " Birmingham " class.) Effingham, Frobisher, Hawkins, Vindictive.
(In **Vindictive** the raised 7·5-in. gun forward is removed and a hangar fitted forward of the bridge.)



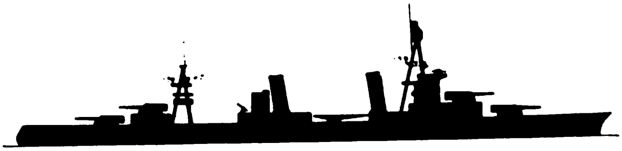
FRANCE. Cruisers. (" Duquesne " class.) Duquesne, Tourville. (" Suffren " class.) Suffren, Colbert, Foch, Dupleix.
(**Colbert, Dupleix** and **Foch** have tripod mainmasts and the catapults between the funnels.)



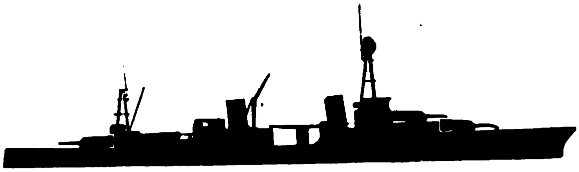
UNITED STATES. Cruisers. ("Astoria" class.) Astoria, New Orleans, Minneapolis, San Francisco, Tuscaloosa.



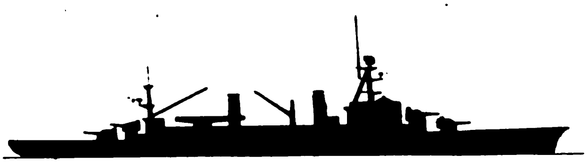
UNITED STATES. Cruisers. Portland and Indianapolis.



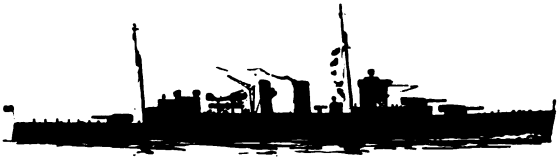
UNITED STATES. Cruisers. (" Pensacola " class.) Salt Lake City, Pensacola.



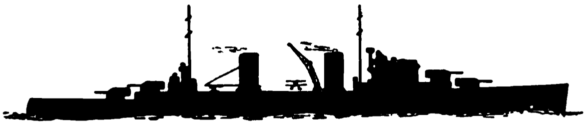
UNITED STATES . Cruisers. (" Chester " class.) Northampton, Chester, Louisville. ("Augusta " class.) Chicago, Houston, Augusta.



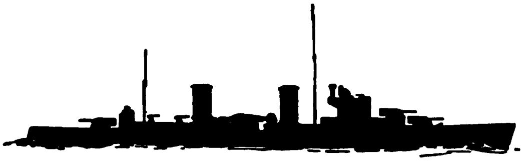
FRANCE. Training Cruiser. Jeanne d'Arc. (The catapults are removed).



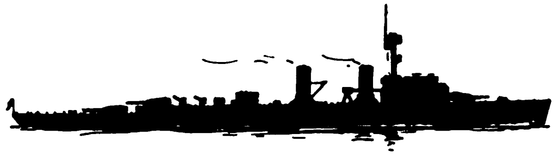
GREAT BRITAIN. Cruisers. York and Exeter. (" York " class.) (In Exeter the funnels and masts are vertical.)



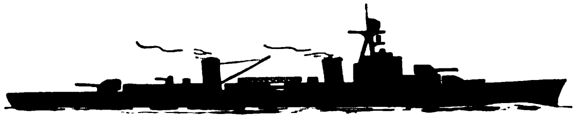
GREAT BRITAIN. Cruisers. (" Amphion " class.) Amphion, Apollo.
COMMONWEALTH OF AUSTRALIA. (" Amphion " Class.) Sydney.



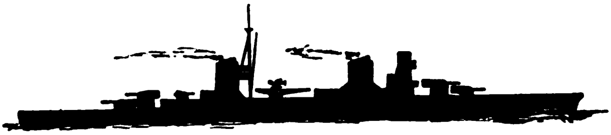
GREAT BRITAIN. Cruisers. (" Arethusa " class.) Arethusa, Galatea, Penelope, Aurora.



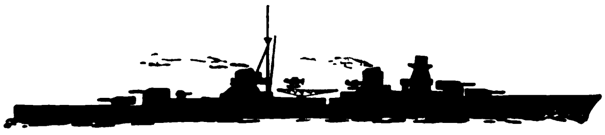
GERMANY. Light Cruisers. Köln, Karlsruhe, Konigsberg.



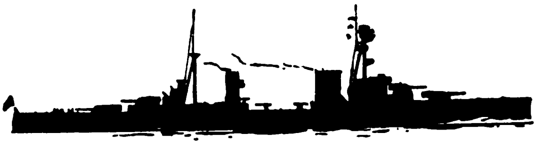
FRANCE. Cruiser Minelayer. Emilé Bertin.



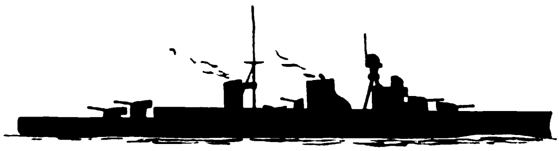
ITALY. Cruisers. ("Condottieri" class.) Montecuccoli, Muzio Attendolo.



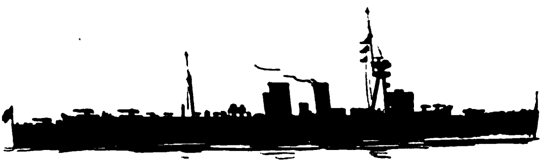
ITALY. Cruisers. ("Attendolo" class.) Eugenio di Savoia, Filiberto Duca d'Aosta.



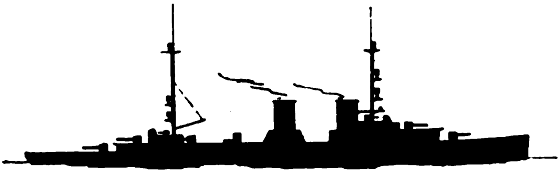
ITALY. Cruisers. ("Condottieri" class.) Alberico de Barbiano, Alberto di Giussano, Bartolomeo Colleoni, Giovanni della Bande Nere.



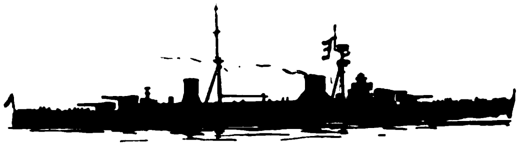
ITALY. Cruisers. ("Condottieri" class.) Armando Diaz, Luigi Cadorna.



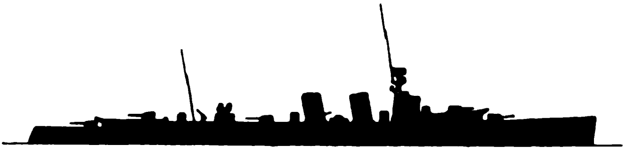
GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)



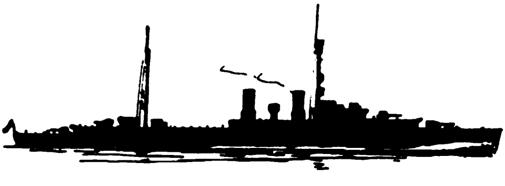
NETHERLANDS. Cruisers. Java, Sumatra.



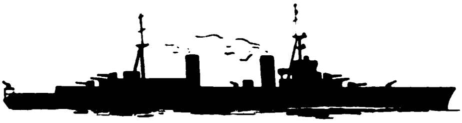
ITALY. Cruisers. ("Trento" class.) Trento, Trieste.



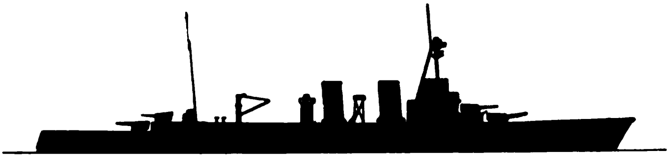
SPAIN. Cruisers. Libertad, Almirante Cervera, Miguel de Cervantes.
(The mainmasts are tripods.)



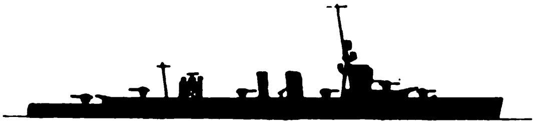
GERMANY. Light Cruiser. Emden.



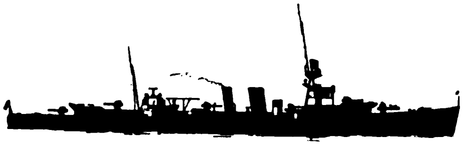
FRANCE. Cruiser Minelayer. Pluton.



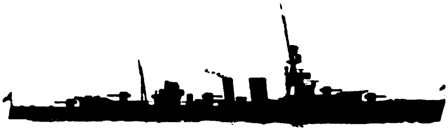
FRANCE. Cruisers. (" Duguay-Trouin " class.) La Motte Picquet, Duguay-Trouin, Primauguet.



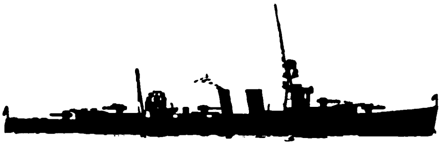
GREAT BRITAIN. Cruisers. (" D " class.) Danae, Dauntless, Dragon.



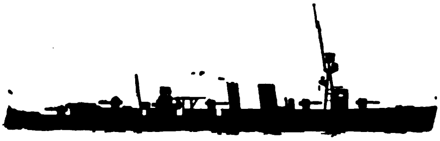
GREAT BRITAIN. Cruisers. (" D " class: repeat vessels.) Delhi, Dunedin, Diomede, Despatch, Durban.



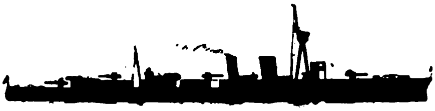
GREAT BRITAIN. Cruisers. (" Ceres " class.) Cardiff, Ceres, Coventry, Curacoa, Curlew.



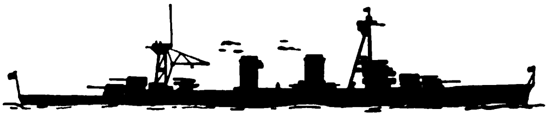
GREAT BRITAIN. Cruisers. ("Carlisle" class.) Cairo, Calcutta, Capetown, Carlisle, Colombo.



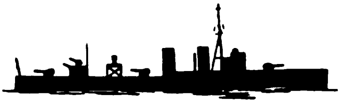
GREAT BRITAIN. Cruisers. (" Caledon " class.) Caledon, Calypso, Caradoc.



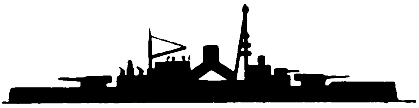
GREAT BRITAIN. Cruisers ("Cambrian" class.) Castor, Constance.



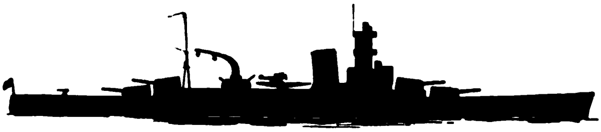
SOVIET UNION. Cruiser. Krasni Kavkaz.



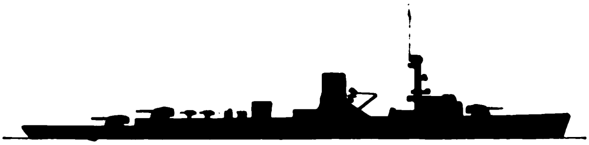
GREECE. **Cruiser.** **Helle.**



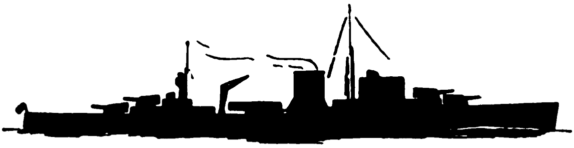
SWEDEN. **Coast Defence Ships.** **Gustav V, Sverige.**
(**Drottning Victoria** at present has two funnels and a tripod mainmast, but is to be reconstructed and modernised as above.)



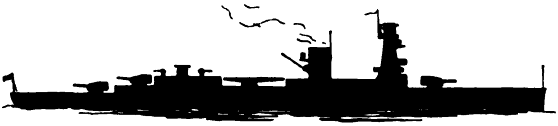
FRANCE. **Cruiser.** **Algérie.**



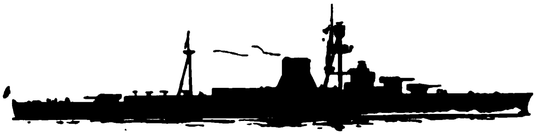
GERMANY. **Light Cruiser.** **Leipzig.**



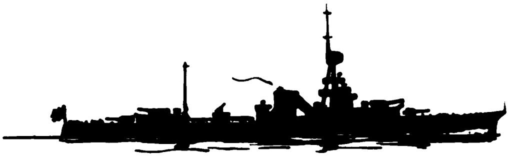
GREAT BRITAIN. **Cruisers.** **("Leander" class.)** **Leander, Achilles, Neptune, Orion.**



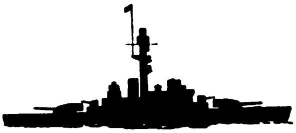
NETHERLANDS. **Cruiser.** **Celebes.**



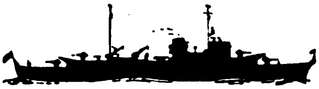
ARGENTINE. Cruisers. Almirante Brown, Vinticinco de Maio.



JAPAN. Light Cruiser. Yubari.



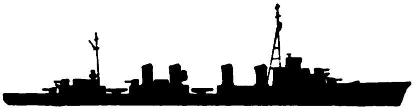
FINLAND. Armoured Gunboats. Vaïnămŏinen, Ilmarinen.



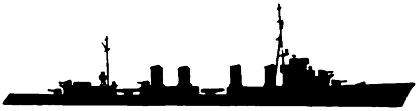
NORWAY. Minelaying and Training Ship. Clav Trygvason.

FLOTILLA LEADERS AND DESTROYERS

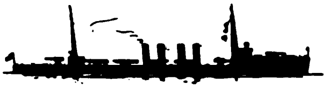
(See pp. 242–269.)



FRANCE. Flotilla Leaders. Cassard, Vauquelin, Kersaint, Tartu, Maillé Brézé, Le Chevalier Paul.

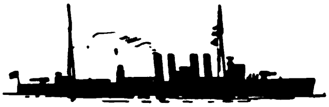


FRANCE. Flotilla Leaders. Bison. Guépard, Lion, Vauban, Valmy, Verdun.

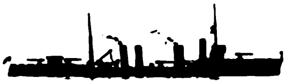


UNITED STATES. Destroyers. Aylwin, Balch, Benham, Duncan, Parker, Cassin, Cummings and Downes.

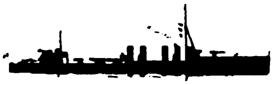
Sampson, Rowan, Davis, Allen, Wilkes, Shaw, Tucker, Conyngham, Porter, Wadsworth, Wainwright, O'Brian, Nicholson, Winslow, McDougal, Cushing and Ericsson, are generally similar.



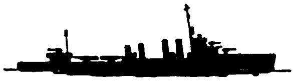
UNITED STATES. Destroyers. The "Flush Deck" type; all U.S. destroyers except those in the preceding silhouette and those with three funnels.



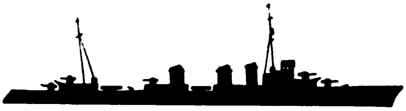
FRANCE. Destroyers. Téméraire, Opiniâtre.



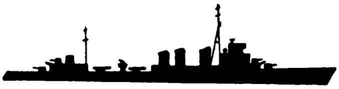
FRANCE. Destroyers. Enseigne Roux, Mécanicien Principal Lestin.



FRANCE. Destroyer. Enseigne Gabolde.

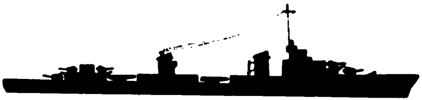


FRANCE. Flotilla Leaders. Tigre, Chacal, Jaguar, Léopard, Panthère, Lynx.

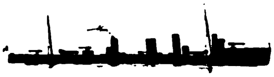


FRANCE. Destroyers. Mistral, Cyclone, Bourrasque, Orage, Ouragon, Simoun, Siroco, Tempête, Tramontane, Typhon, Trombe, Tornado.

POLAND. Destroyers. Burza, Wicher, are similar.

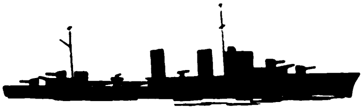


FRANCE. Flotilla Leaders. "Le Fantasque" class (6 ships).

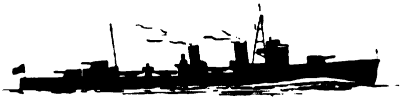


FRANCE. Destroyers. Algérien, Annamite, Arabe, Bambara, Hova, Kabyle, Marocain, Sakalave, Sénégalais, Somali, Tonkinois, Touareg.

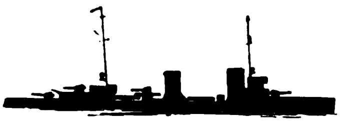
ITALY. Destroyers. Gen. A. Cantore, Gen. A. Chinotto, Gen. A. Papa, Gen. A. Cascino, Gen. M. Prestinari, Gen. C. Montanari, A. Bassini, E. Cosenz, F. Stocco, G. Carini, G. Medici, G. Acerbi, G. la Farina, G. la Masa, G. Sirtoli, N. Fabrizi, V. Orsini.



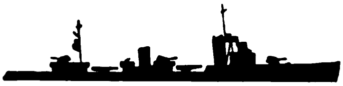
YUGO SLAVIA. Flotilla Leader. Dubrovnik.



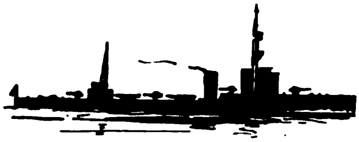
JAPAN. 1st Class Destroyers. "Fubuki" class. (24 ships.)



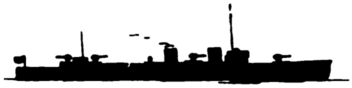
FRANCE. Flotilla Leader. Amiral Sénès.



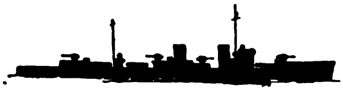
ITALY. Flotilla Leaders (Scouts). "Navigatori" class. A. da Mosto, etc. (12 ships.)



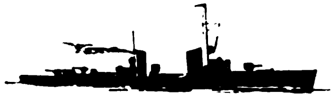
ITALY. Flotilla Leaders (Scouts). Leone, Pantera, Tigre.



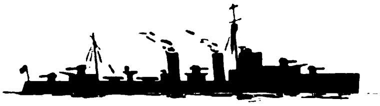
JAPAN. 1st Class Destroyers. "Mutsuki" class (12 ships), and "Kamikase" class (9 ships).



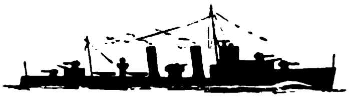
JAPAN. 1st class Dectroyers. "Minokase" class (15 ships).



GERMANY. Destroyers. Iltis, Wolf, Tiger, Luchs, Jaguar, Leopard, Seeadler, Greif, Albatros, Kondor, Falke, Möwe.

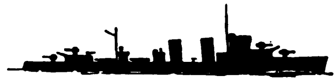


GREAT BRITAIN. Flotilla Leader. Codrington.



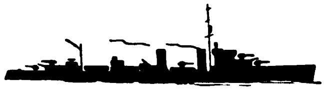
GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.

Flotilla Leaders. Keith, Duncan and Kempenfelt.

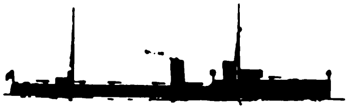


PORTUGAL. Destroyers. Vouga, Lima, Dao.

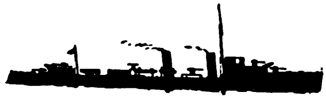
COLOMBIA. Destroyers. Antioquia, Caldas.



ARGENTINE. Flotilla Leaders. Mendoza, La Rioja, Tucuman.

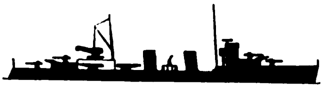


ITALY. Flotilla Leaders (Scouts). Carlo Mirabello, Augusto Riboty.

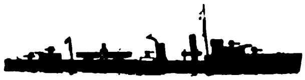


GREAT BRITAIN. Flotilla Leaders. Broke, Keppel, Shakespeare, Spenser, Wallace, Bruce, Douglas, Campbell, Mackay, Malcolm, Montrose, Stuart. [In Stuart the torpedo tubes are removed.]

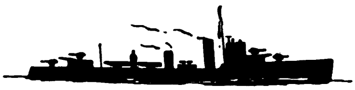
SPAIN. Flotilla Leaders. Almirante Valdes, etc., generally similar.



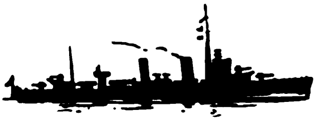
HOLLAND. Destroyers. De Ruyter, Evertsen, Piet Hein, Kortenaer, Banckert, Van Nes, Van Galen, Witte de With.



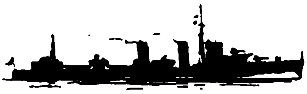
GREAT BRITAIN. Destroyers. Vanessa, Vanity, Vanoc, Vanquisher, Vectis, Vega, Velox, Vendetta, Venetia, Venturous, Verdun, Versatile, Vesper, Vidette, Vimiera, Violent, Vivacious, Vivien, Vimy (*late* Vancouver), Vortigern, Valhalla, Valentine, Valkyrie, Valorous, Vampire, Viceroy, Viscount, Voyager, Wakeful, Walker, Walpole, Walrus, Warwick, Watchman, Waterhen, Wessex, Westcott, Westminster, Whirlwind, Whitley, Winchelsea, Winchester, Wolfhound, Wolsey, Woolston, Wrestler, Wryneck.



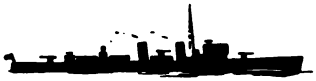
GREAT BRITAIN. Destroyers. Whitehall, Whitshed, Wildswan, Witherington, Wivern, Wolverine. Worcester, Wishart, Witch.



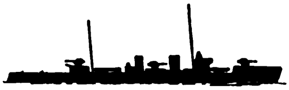
GREAT BRITAIN. Destroyers. Ambuscade, Amazon.



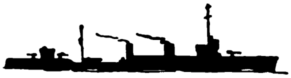
CHILE. Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Aldea.



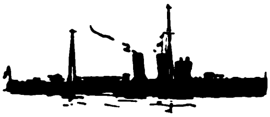
SWEDEN. Destroyers. Klas Horn, Klas Uggla, Ehrensköld, Nordenskjold.



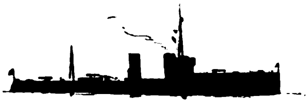
JAPAN. 2nd class Destroyers. "Wakatake" class (7 ships), and "Kaya" class (19 ships).



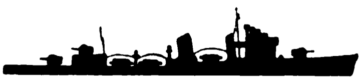
FRANCE. Destroyers. Aventurier, Intrèpide.



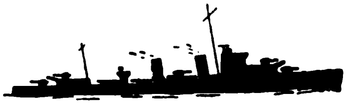
ITALY. Destroyers. Q. Sella, B. Ricasoli, F. Crispi, G. Nicotera.



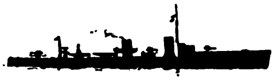
ITALY. Destroyers. Alessandro Poerio and Guglielmo Pepe.



JAPAN. Destroyers. "Hibiki" class.

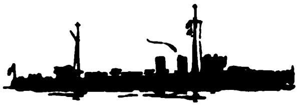


GREAT BRITAIN. Flotilla Leader. Exmouth.

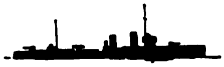


GREAT BRITAIN. Destroyers. Admiralty "S" class.

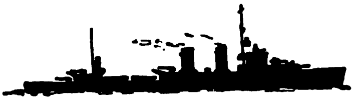
ITALY. Destroyers. Palestro, San Solferino, Martino, Confienza.



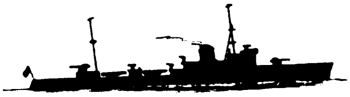
ITALY. Destroyers, Turbine. Nembo, Euro, Borea, Espero, Ostro, Zeffiro, Aquilone, N. Sauro, F. Nullo, D. Manin, C. Battisti.



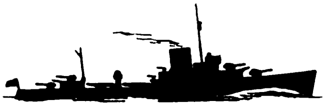
DENMARK. Torpedo Boats (1st Class). Glentin, Hogen, Ornen, Laxen, Dragen, Hvalen.



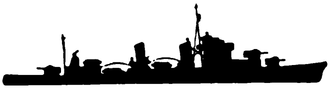
UNITED STATES. Destroyers. "Farragut" class.



ITALY. Destroyers. Dardo, Freccia, Strale, Saetta, Folgore, Lampo, Baleno, Fulmine.



GREECE. Destroyers. Hydra, Spetzai, Psara and Coundouriotis.



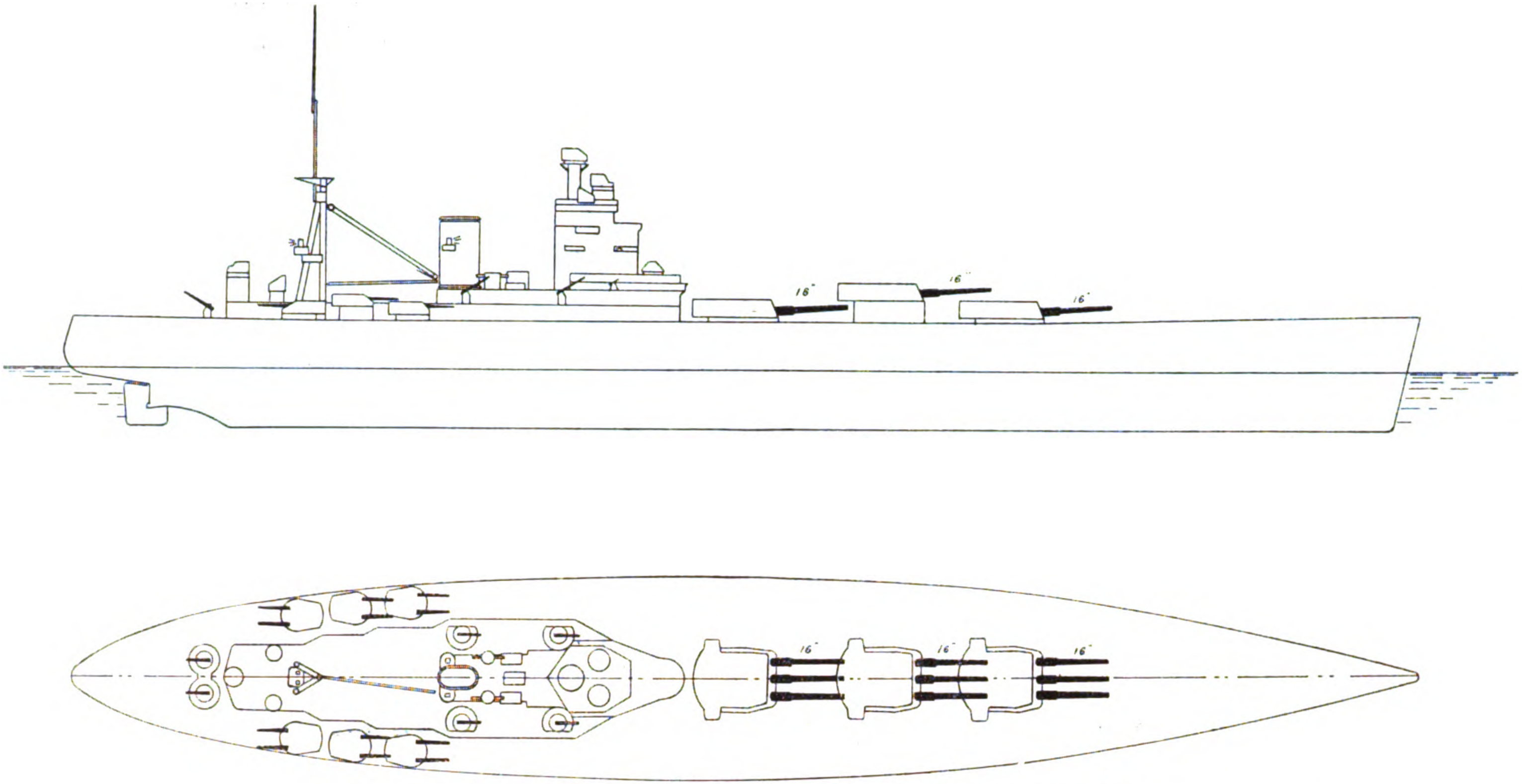
JAPAN. Destroyers. "Ariako" class 17 ships).

PLANS OF
BRITISH AND FOREIGN WARSHIPS

GREAT BRITAIN.

BATTLESHIPS.

Nelson. **Rodney.**



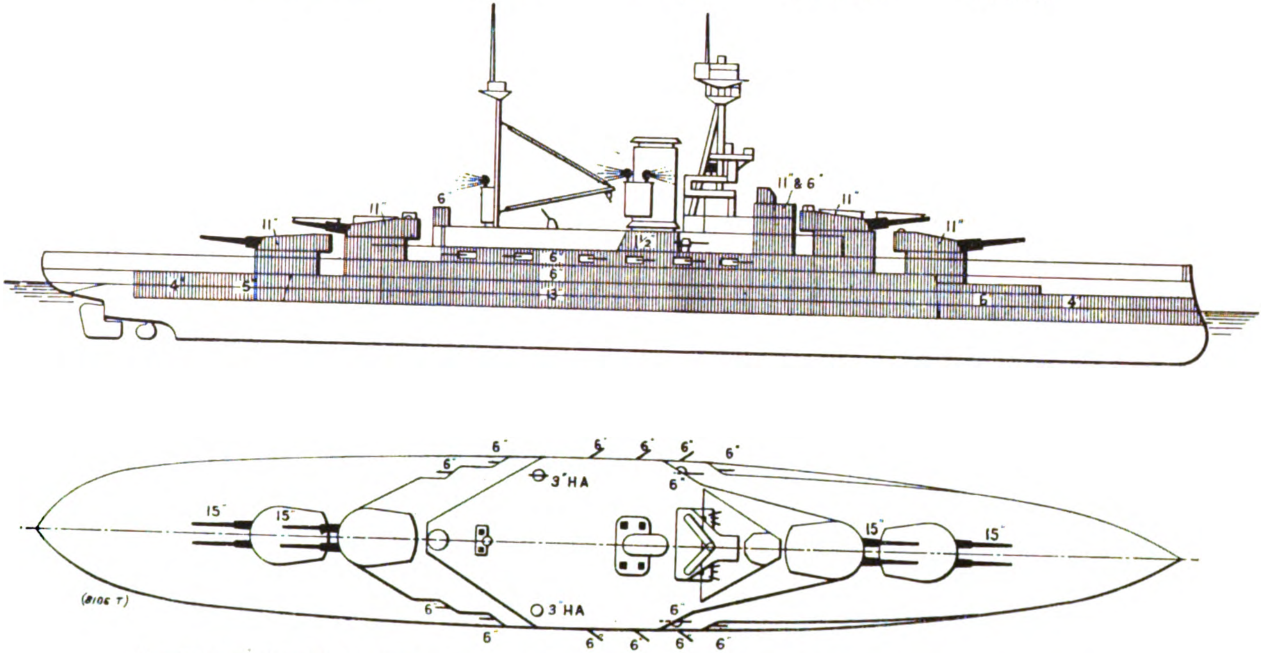
Length (extreme), 710 ft.; Rodney, 33,900 tons; Nelson, 33,500 tons; Speed, 23 knots.
Armament, 9—16-in.; 12—6-in.; 6—4·7-in. A.A.; 4—3-pr.; 6—2-pr. Pom Poms; 11 L.; 5 M.; 2 24-in. submerged torpedo tubes.

NOTE.—A 14-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in.

GREAT BRITAIN.

BATTLESHIPS.

Royal Sovereign. Royal Oak. Revenge. Resolution. Ramillies.



Length (extreme), 620 ft. 6 ins.* ; Length B.P., 580 ft. ; 29,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916-17.
Armament, 8—15 in. ; 12—6 in. ; 4—4-in. A.A. ; 4—3-pr. ; 5 M ; 11 L. ; 2—21-in. submerged torpedo tubes.

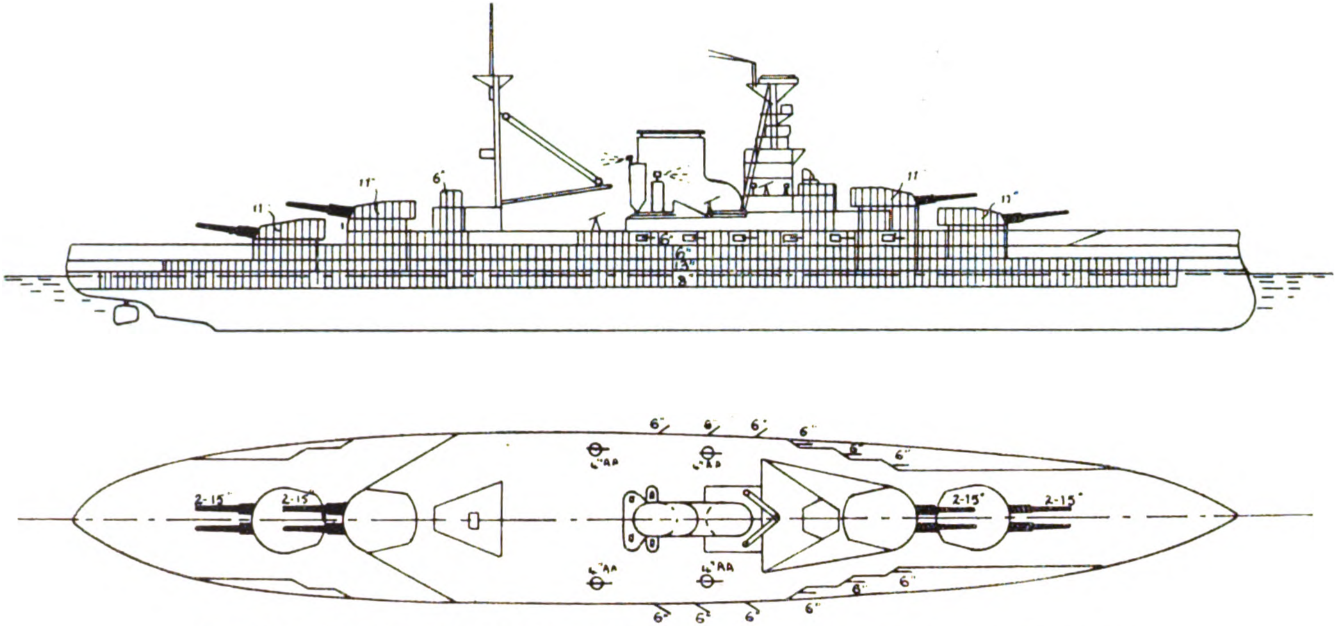
Corrections to plan :—Searchlights on mainmast and the superstructure 6-in. guns now removed. Four 4-in. A.A. guns are fitted on the superstructure instead of the 3-in. H.A. shown.

*** Revenge, 625 ft. 9 in.**

GREAT BRITAIN.

BATTLESHIPS.

Queen Elizabeth. Warspite. Barham. Valiant, Malaya.
(As reconstructed 1926-31.)

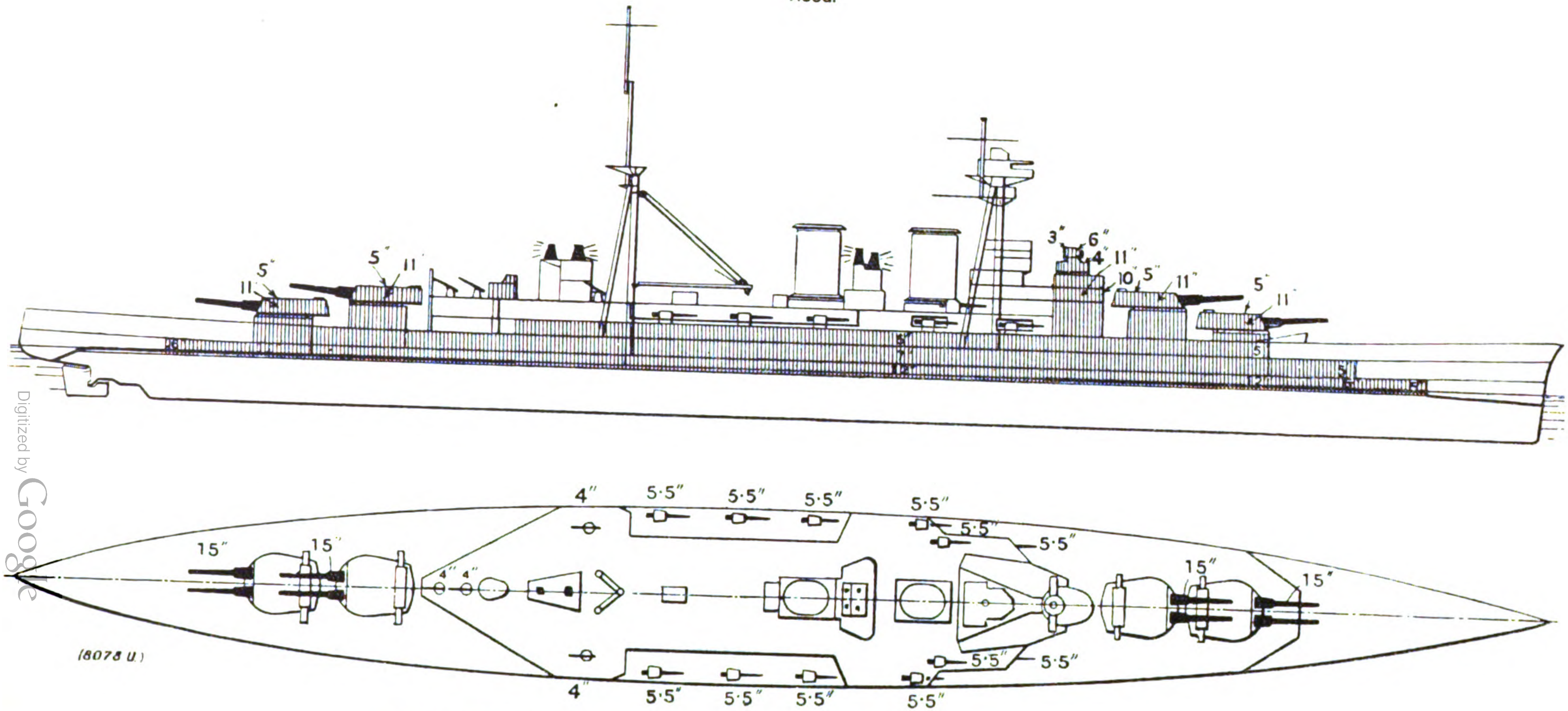


Length B.P., 600 ft.; (extreme 639¾—644½ ft.); 31,100 tons; Speed, 25 knots (without bulges); Completed, 1915–1916.
Armament, 8—15-in.; 12—6-in.; 4—4-in. A.A.; 4—3-pr.; 5 M.; 11 L.; 2—21-in. submerged torpedo tubes.

GREAT BRITAIN.

BATTLE-CRUISER.

Hood.

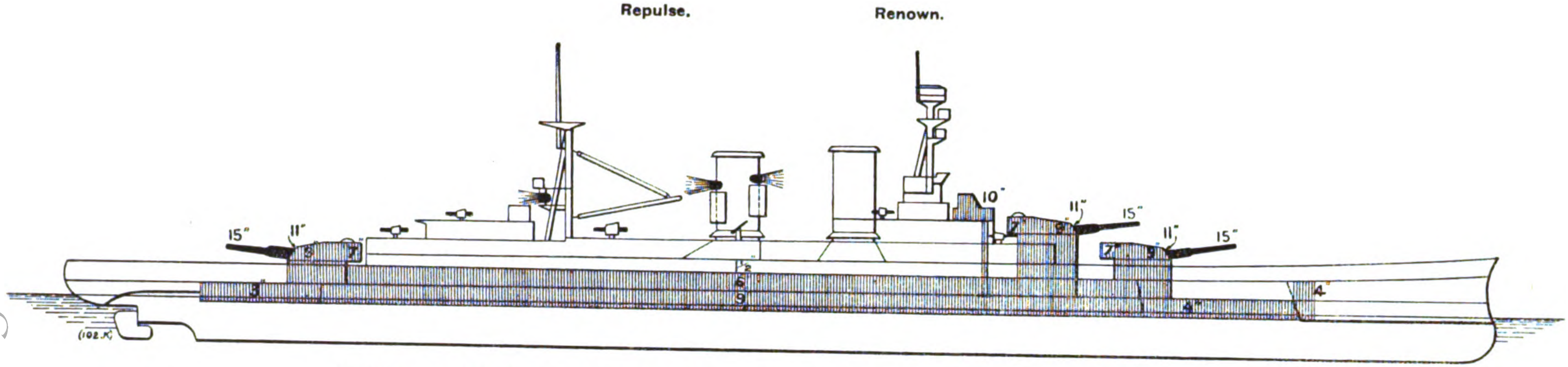


Length (extreme), 860 ft. 10 ins.; Length B.P., 810 ft.; 42,100 tons; Speed, 31* knots; Completed, 1920.
Armament, 8—15-in.; 12—5·5-in.; 4—4-in A.A.; 4—3-pdr.; 5 M.; 11 L.; 4 A.W. and 2 sub. 21-in. torpedo tubes.

* Trials at 44,600 tons, 31·89 knots with 151,000 S.H.P.

GREAT BRITAIN.

BATTLE-CRUISERS.



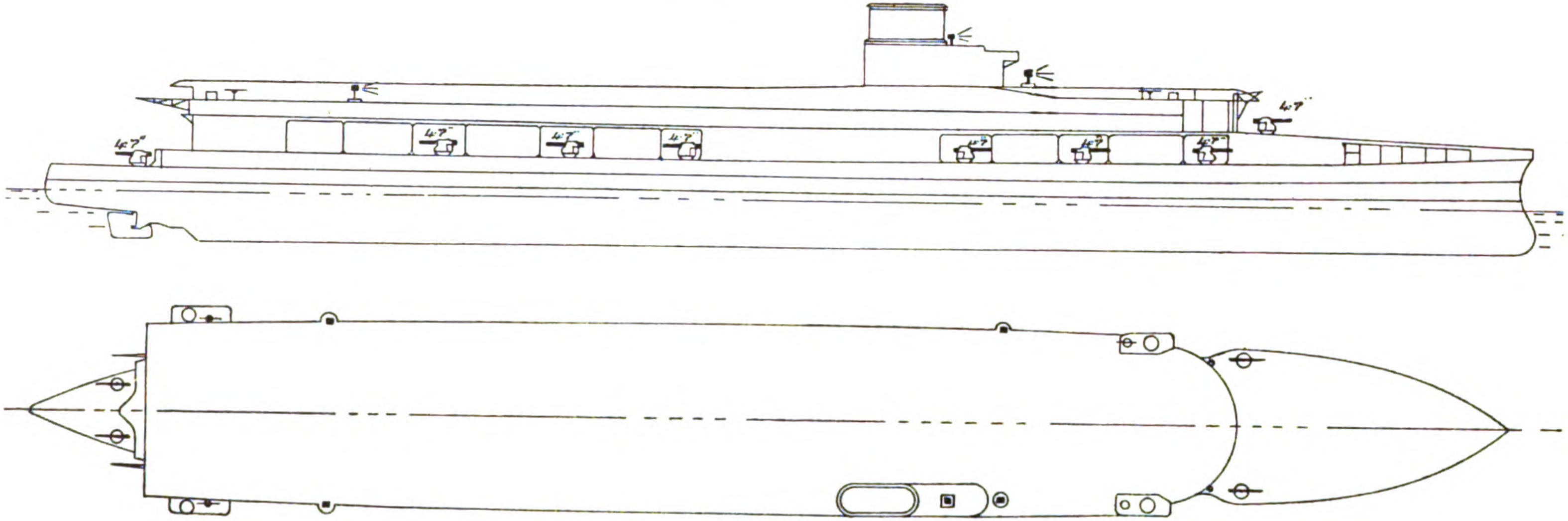
Length (extreme), 794 ft. 2 ins.; Length B.P., 750 ft.; 32,000 tons; Speed, 31·5 knots (without bulges); Completed, 1916.
Armament, 6—15-in.; 15—4-in.; 4—3-pr.; 4—4-in. A.A.; 5 M.; 11 L.; 2 submerged torpedo tubes (Repulse, 8 a.w. in addition).

NOTE.—Repulse originally had a 6-in. main belt, but was re-armoured in 1920–21. Re-armouring of the Renown was completed during 1926.

GREAT BRITAIN.

AIRCRAFT CARRIERS.

Courageous. **Glorious.**

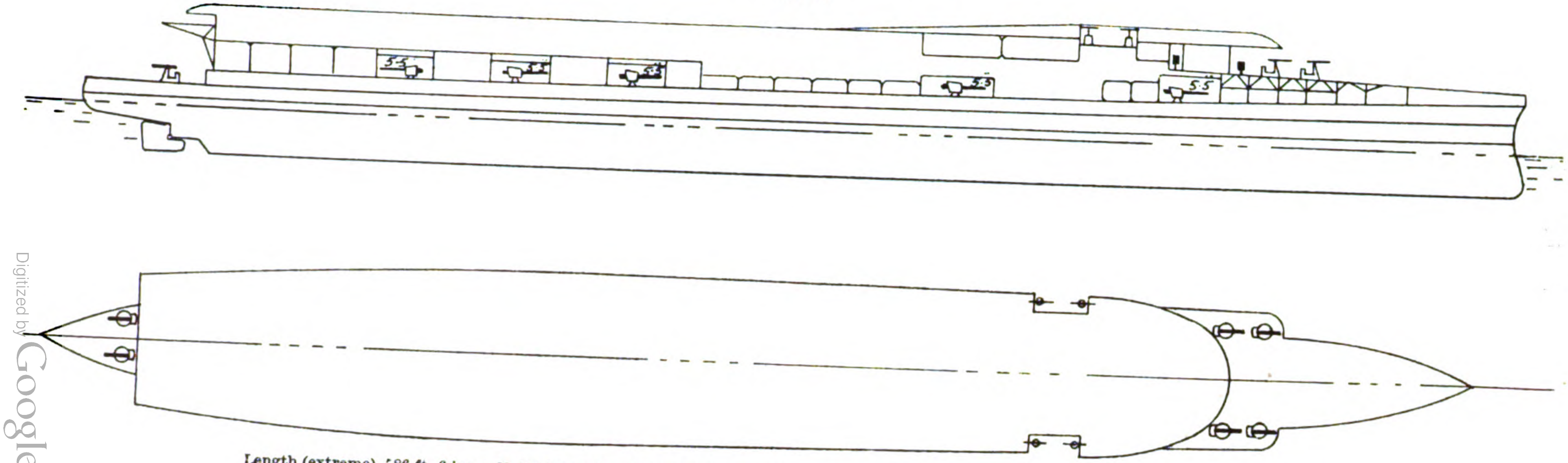


Length (extreme), 786 ft. 3 ins.; 22,500 tons; Speed, 30½ knots; Launched as cruisers (1916); converted to aircraft carriers (completed 1928 and 1930 respectively).
Armament, 16—4·7-in.; 4—3-pr.; 4—2-pr. Pom Poms; 4 M.; 42 L.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Furious.

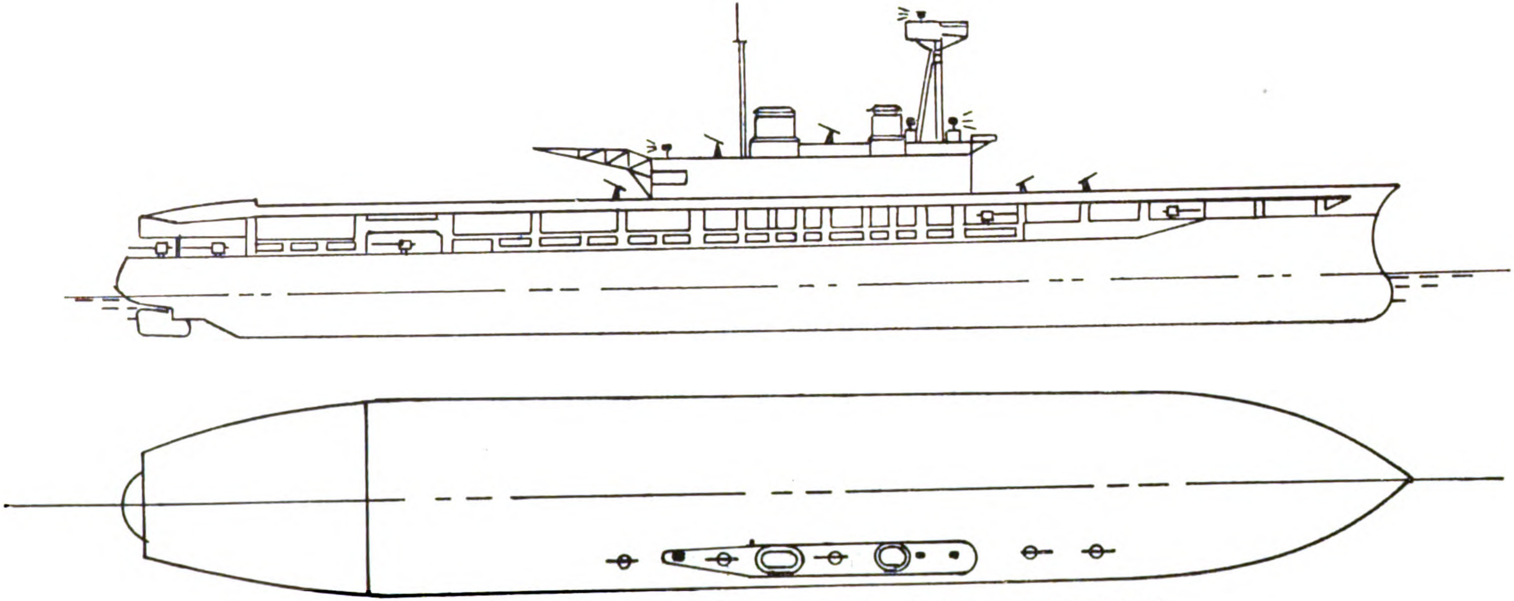


Length (extreme), 786 ft. 6 ins.; 22,450 tons; Speed, 31 knots; Completed as a cruiser, 1917; Conversion to aircraft carrier completed 1925.
Armament, 10—5·5-in.; 3—4-in. A.A.; 4—3-pr.; 4—2-pr.; 46 smaller.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Eagle.

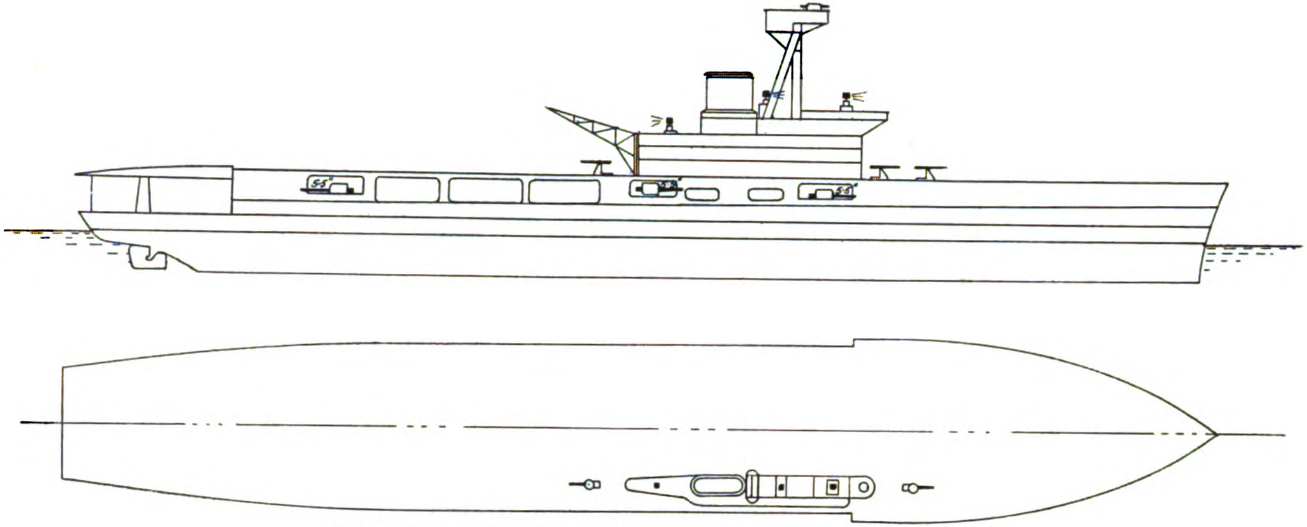


Length (extreme), 667 ft. 6 ins.; 22,600 tons; Speed, 24 knots; Completed as an aircraft carrier, 1924.
Armament, 9—6-in.; 5—4-in. A.A.; 4—3-pr.; 32 smaller.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Hermes.



Length (extreme), 599 ft. 6 ins.; 10,850 tons; Speed, 25 knots; Completed 1924.
Armament, 6—5·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 M.; 16 L.

GREAT BRITAIN.

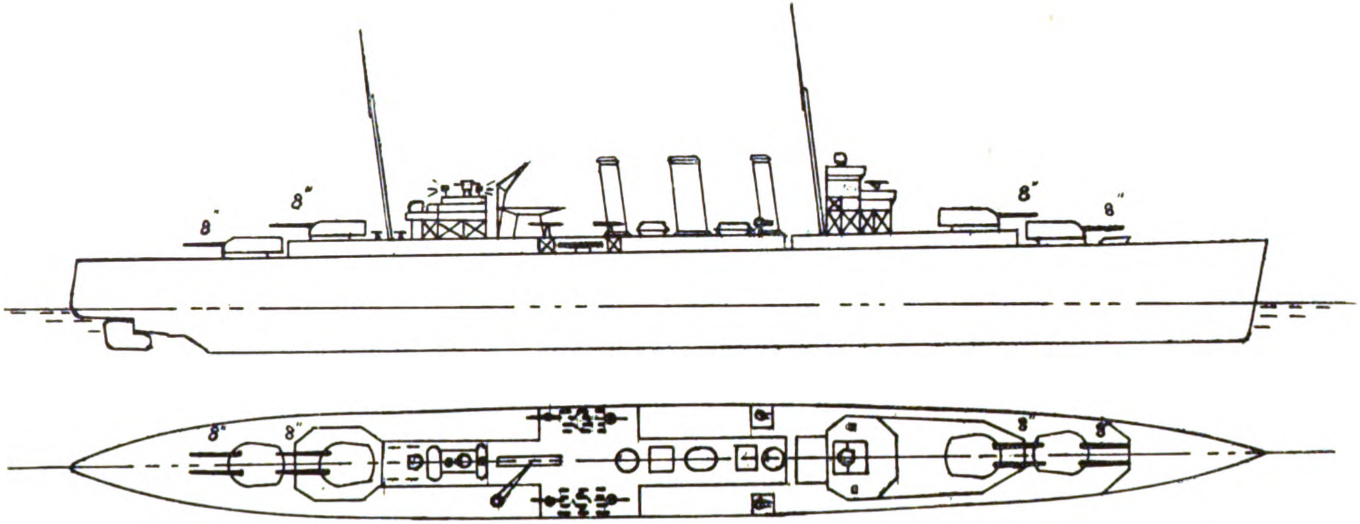
CRUISERS.

" London " Class.

London. **Sussex.** **Shropshire.** **Devonshire.**

" Norfolk " Class.

Dorsetshire.* **Norfolk.***



Displacements, 9,730—9,900 tons ; Length (extreme), 630 ft. ; Norfolk and Dorsetshire, 633 ft. Armament, 8—8-in. ; 4—4-in. A.A. ; 4—3-pr. ; 4—2-pr. Pom Poms ; 4 M. ; 8 L. ; 8—21-in. torpedo tubes.

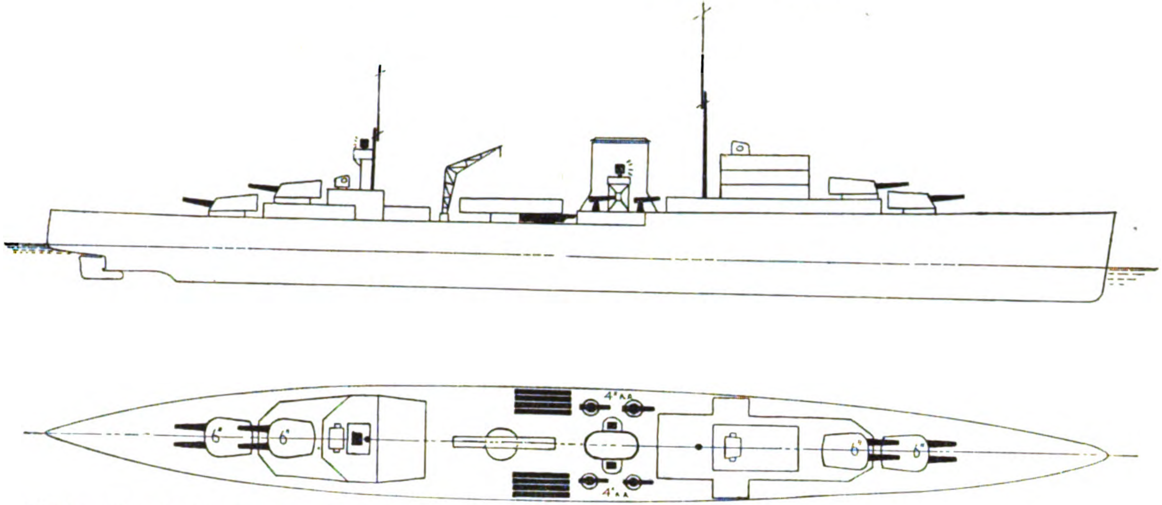
*** In Dorsetshire and Norfolk the seaplane crane and the 4—4-in. guns are slightly forward of the positions shown.**

GREAT BRITAIN.

CRUISERS.

“*Leander*” *Class.*

Leander. **Achilles.** **Neptune.** **Orion.**



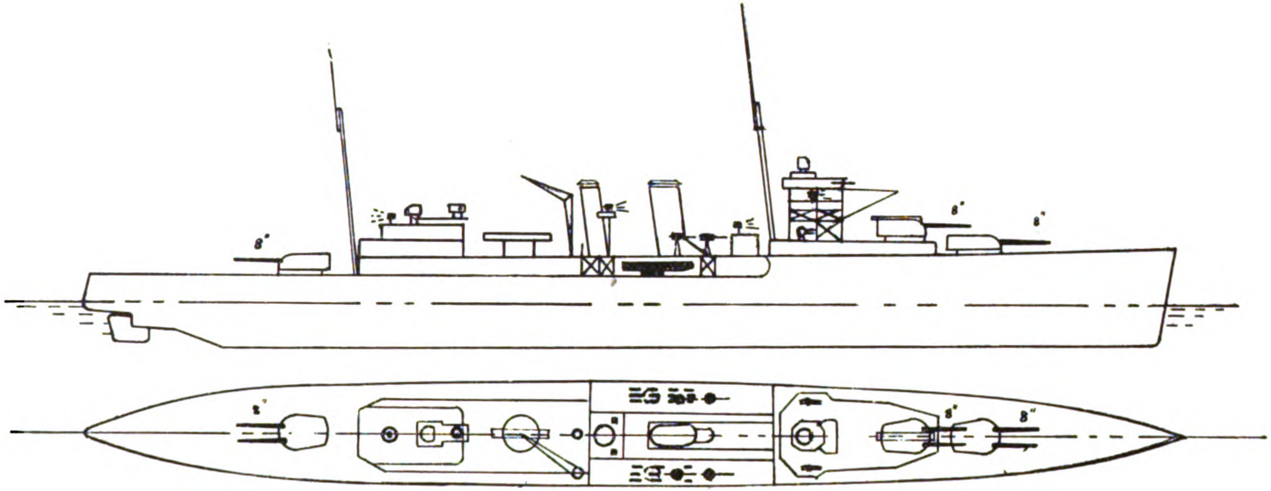
Displacement, 7,000 tons; Length (extreme), 554 ft. 6 ins.; Speed 32½ knots. Armament 8—6-in., 4—4-in. A.A., 4—3-pr., 8 torpedo tubes. Leander and Achilles, completed 1933. Neptune and Orion, completed 1934.

GREAT BRITAIN.

CRUISERS.

"York" Class.

York. Exeter.*



Displacement: York, 8,250 tons; Exeter, 8,390 tons; Length (extreme), 575 ft.; Speed: York, 32¼ knots; Exeter, 32 knots. Armament, 6—8-in. 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 4 M; 8 L.; 6—21-in. torpedo tubes.

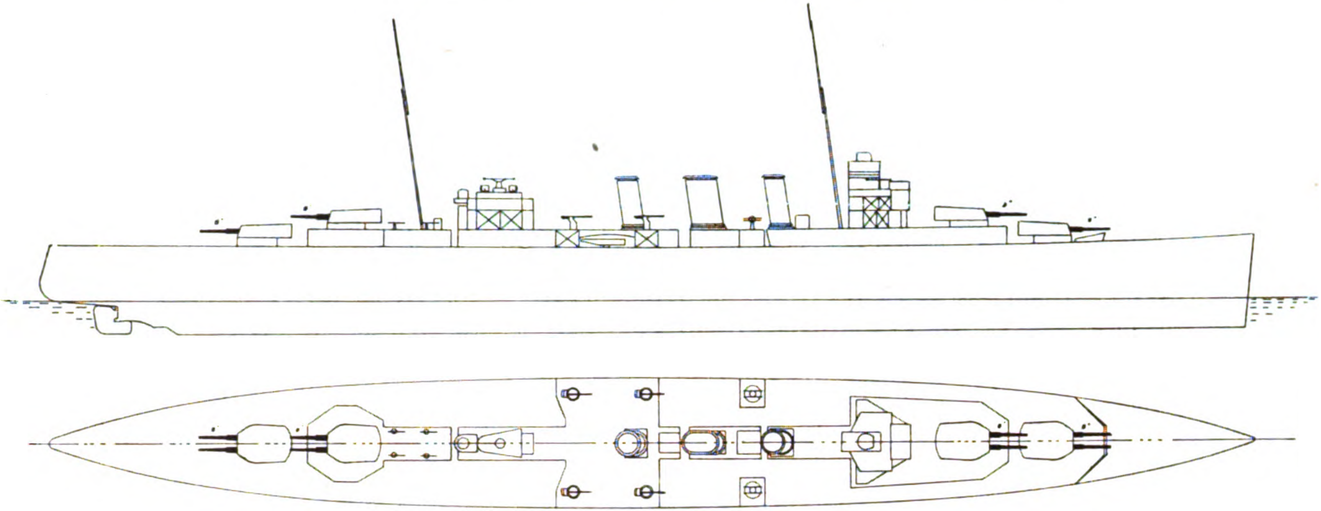
* In Exeter funnels and masts are vertical, and the mainmast is taken up through the superstructure.

GREAT BRITAIN.

CRUISERS.

"Kent" Class.

Kent. **Berwick.** **Cumberland.** **Suffolk.** **Cornwall.** **Australia.*** **Canberra.***



Length (extreme), 630 ft. ; B.P., 590 ft. ; 9,750 to 9,870 tons ; Speed, 31¼ knots.
Armament, 8—8-in. ; 4—4-in. A.A. ; 4—3-pr. ; 4—2-pr. Pom Poms ; 4 M. ; 8 L. ; 2 Q.R. 21-in. torpedo tubes.

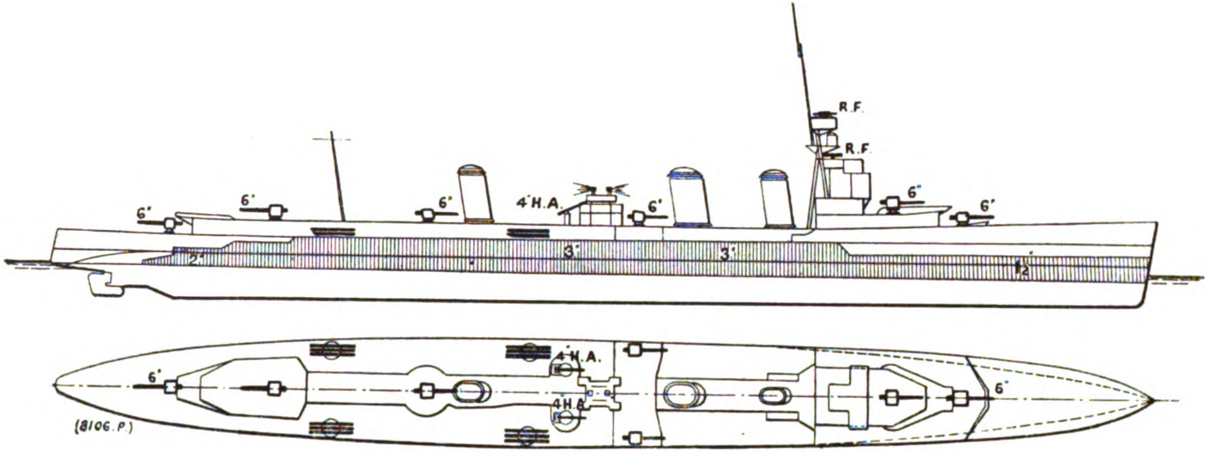
* H.M. Australian Navy.

GREAT BRITAIN.

CRUISERS.

"E" Class.

Emerald. **Enterprise.***



Length (extreme), 570 ft.; Length B.P., 535 ft.; Emerald, 7,550 tons; Enterprise, 7,580 tons; Speed, 33 knots.
Armament, 7—6-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; 16—21-in. torpedo tubes.

Correction to plan: The torpedo tubes are in quadruple sets.

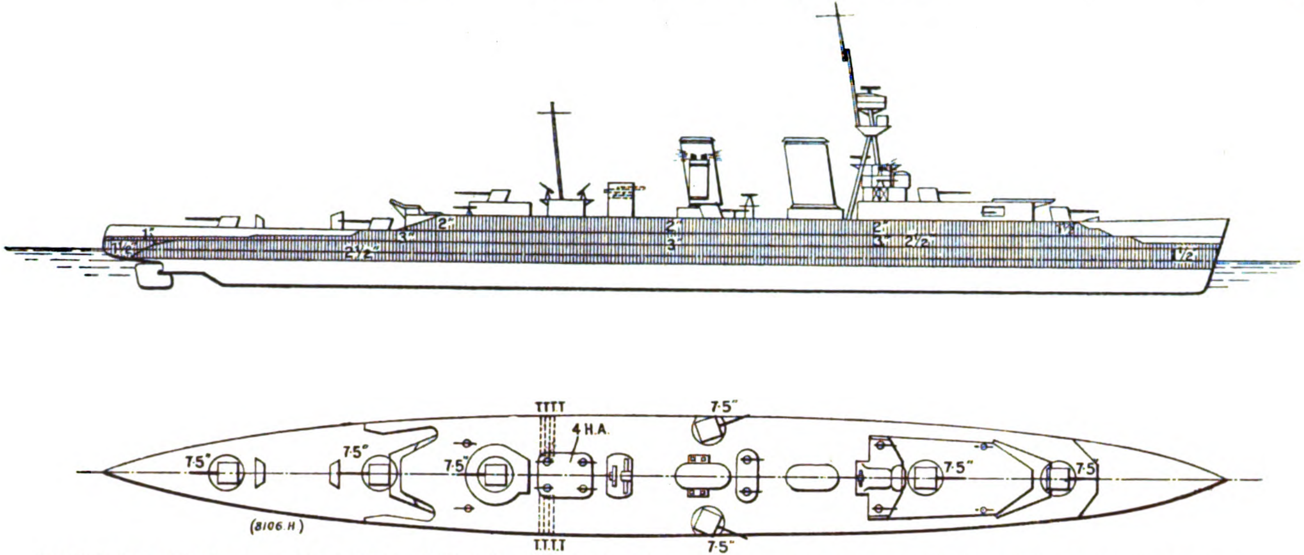
* In Enterprise the two forward 6-in. guns are mounted in a twin-mounting on forecastle deck.

GREAT BRITAIN.

CRUISERS.

Improved "Birmingham" Class.

Effingham. **Hawkins.** **Frobisher.** **Vindictive.***



Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,770—9,996 tons; Speed: Effingham and Frobisher 30½ knots; Vindictive 30 knots: Hawkins 29½ knots.
Armament: Effingham: 7—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 5 torpedo tubes. Frobisher: 6—7·5-in.; 2—4-in. A.A.; 4—3-pr.; 2 M.; 8 L.; 2 torpedo tubes. Hawkins: 7—7·5-in.; 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 6 torpedo tubes. Vindictive: 6—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 2 L.; 6 torpedo tubes.

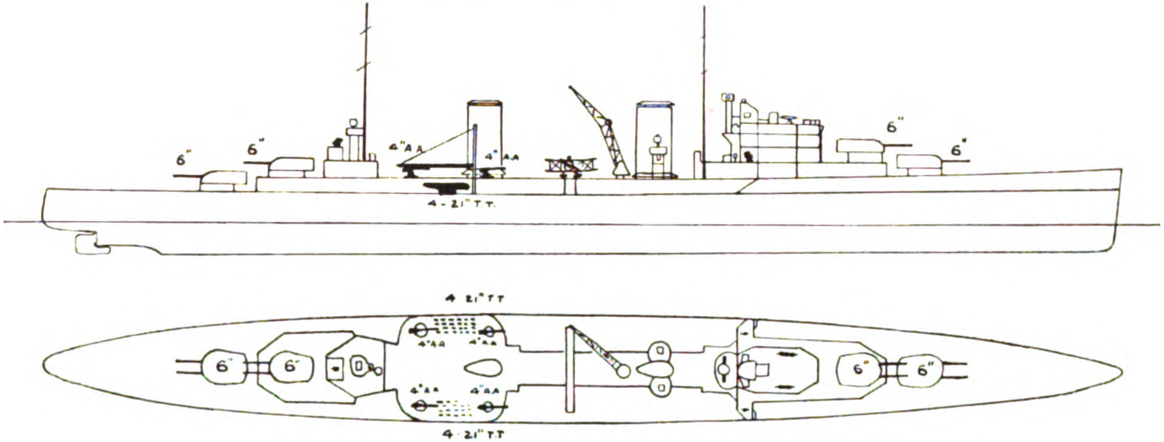
* Vindictive has an aircraft hangar mounted forward of the bridge, and to accommodate this the raised 7·5-in. gun forward has been removed.
Frobisher is now employed as Cadets' Sea-going Training Ship

GREAT BRITAIN.

CRUISERS.

"*Amphion*" *Class.*

Amphion. **Apollo.** ***Sydney.**



Displacement, 7,000 tons ; Length (extreme), 560 ft. ; Speed, 32½ knots.
Armament, 8—6-in ; 4—4-in. A.A. : 21 smaller guns ; 4 quadruple 21-in. torpedo tubes ; 1 catapult.

Amphion and Apollo carry 2 aircraft and Sydney 1 aircraft. Sydney completed 1935 ; Amphion and Apollo completed in 1936.

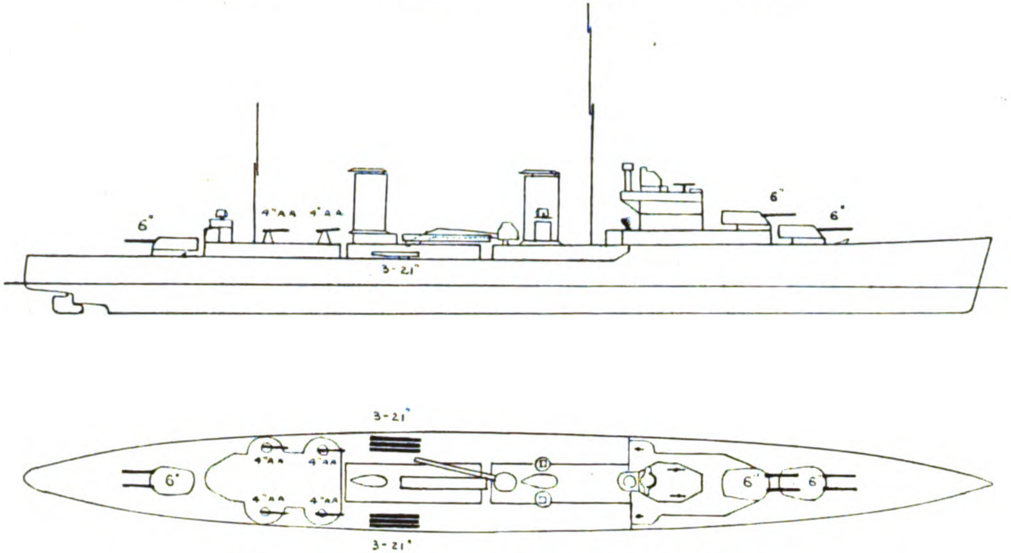
* H.M. Australian Navy.

GREAT BRITAIN.

CRUISERS

"*Arethusa*" *Class.*

Arethusa. **Galatea.** **Penelope** **Aurora.**



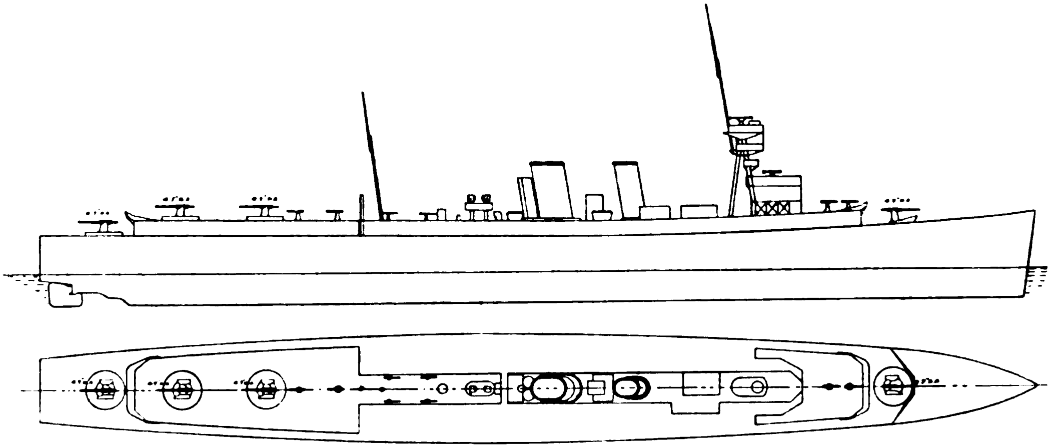
Displacement, 5,200 tons ; Length (extreme), 506 ft. ; Speed, 32¼ knots.
Armament, 6—6-in. ; 4—4-in. A.A. ; 18 smaller ; 2 triple 21-in. torpedo tubes ; 1 catapult, 1 aircraft.

Arethusa and Galatea completed 1935 ; Penelope and Aurora building.

GREAT BRITAIN.

CRUISER MINELAYER.

Adventure.



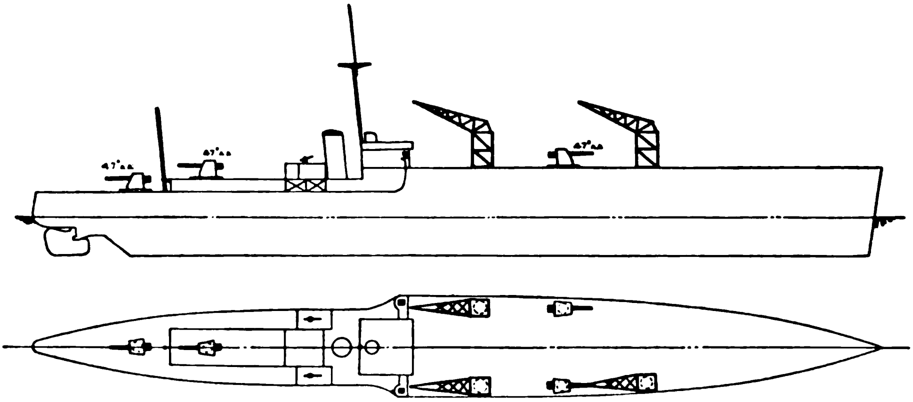
Length (extreme), 539 ft.; Length B.P., 500 ft.; 6,800 tons; Speed, 27¾ knots.
Armament, 4–4·7-in. A.A.; 4—3-pr.; 4—2-pr.; 2 M.; 8 L.; 310 mines.

(Stern has been extended.)

ROYAL AUSTRALIAN NAVY.

SEAPLANE CARRIER.

Albatross.



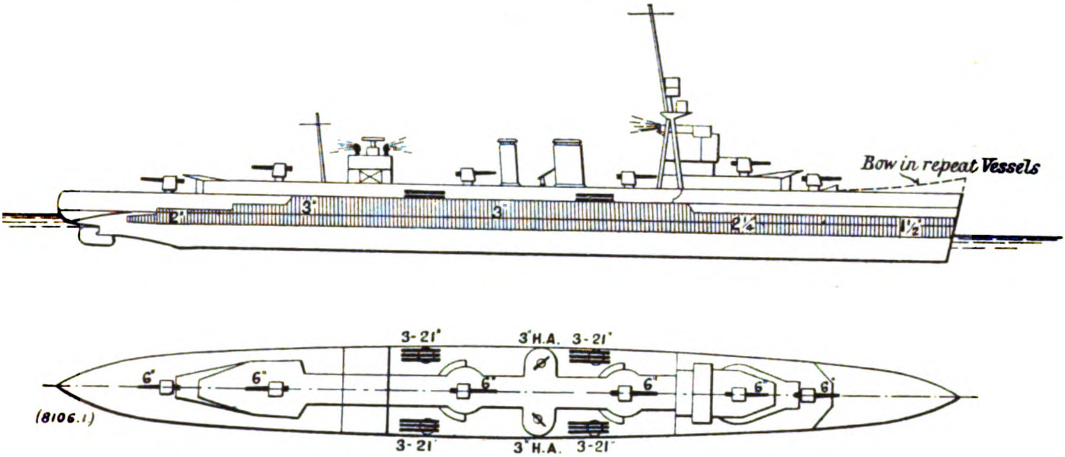
Length, 443¾ ft.; 4,800 tons; Speed, 21 knots; Completed 1929.
Armament, 4—4·7-in. A.A.; 4—2-pdr. Pom Poms; 4—3-pdr.; 4 M.; 4 L.; 6 seaplanes.

GREAT BRITAIN

CRUISERS.

"D" Class.

***Despatch.** ***Diomede.** **Danae.** ***Dunedin.** **Dauntless.** ***Durban.** **Dragon** ***Delhi.**



Length, 472¾ ft. ; 4,850 tons ; Speed, 29 knots ;
Armament, 6—6-in. ; 3—4-in. A.A. ; 4—3-pr., 2—2-pr. ; 2 M ; 8 L. ; 12—21-in. torpedo tubes.

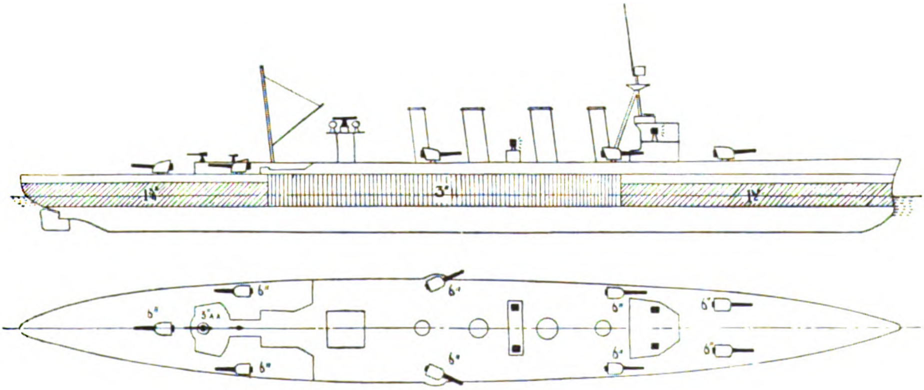
Diomede and Dunedin are attached to the New Zealand Division.

* Repeat vessels.

ROYAL AUSTRALIAN NAVY.

CRUISER.

Adelaide.



Length, 462½ ft. ; 5,100 tons ; 25 knots.
Armament, 9—6-in. ; 4—3 pr. ; 1—3-in. A.A. ; 2 submerged 21-in. torpedo tubes.

GREAT BRITAIN.

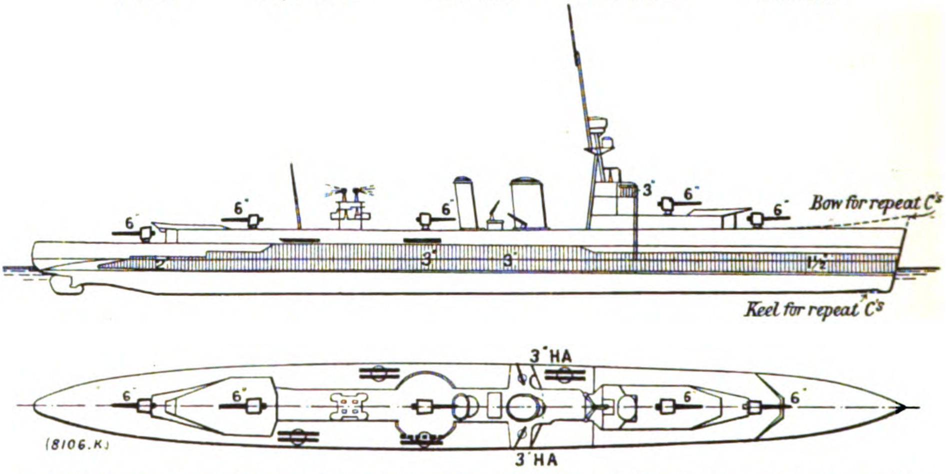
CRUISERS.

"Ceres" Class.

Ceres. **Curacoa.** **Curlew.** **Cardiff.** **Coventry.**

"Carlisle" Class.

***Cairo.** ***Cape Town.** ***Carlisle.** ***Colombo.** ***Calcutta.**



Length (extreme), 450 ft. (451 ft. 9 ins. Repeat Vessels); Length B.P., 425 ft.; 4,290 tons; Repeat vessels, 4,200 tons; Speed, 29 knots; Completed, 1917–18 (Repeat Vessels, 1918–22).

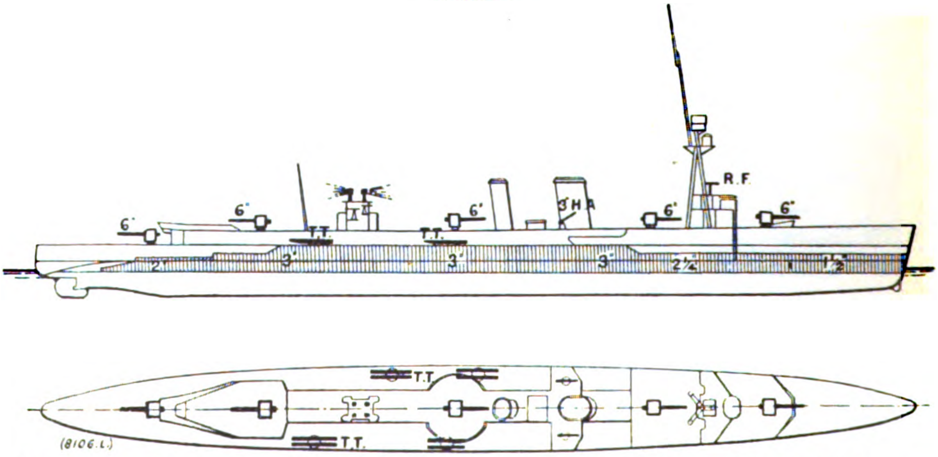
Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 above-water 21-in D.R. torpedo tubes. Cardiff, Curacoa, and Ceres have 2–3-pr.

*** Repeat vessels.**

CRUISERS.

"Caledon" Class.

Caledon. **Calypso.** **Caradoc.**

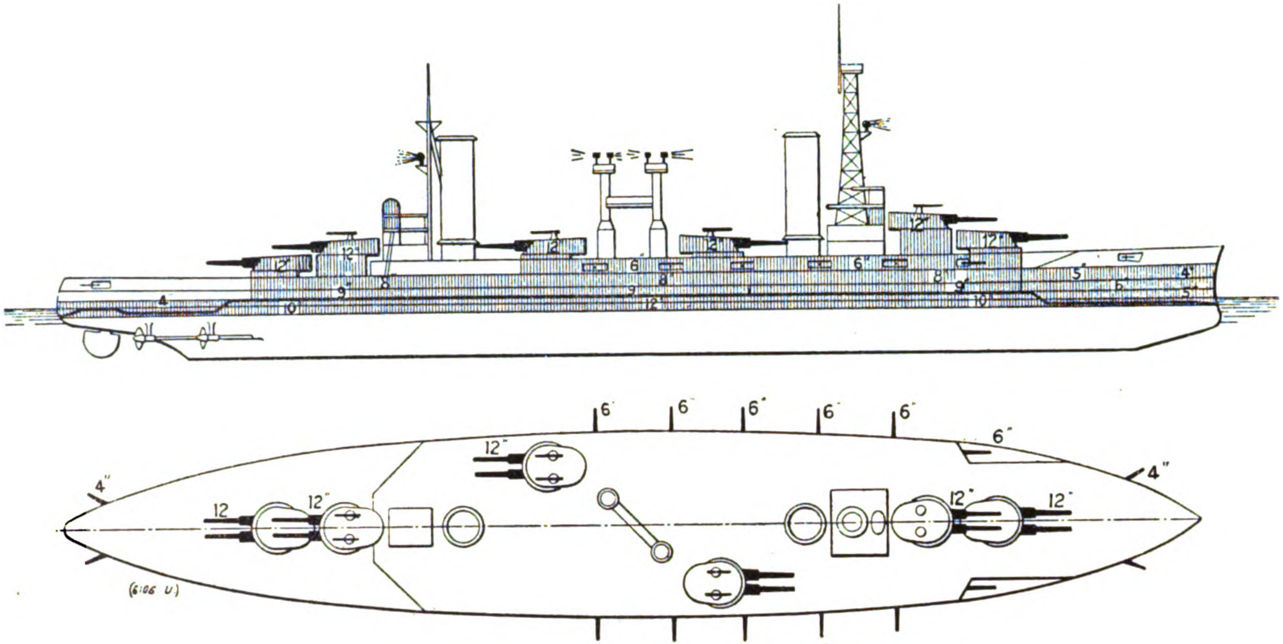


Caledon
Calypso
Caradoc
Length (extreme), 450 ft.; Length B.P., 425 ft.; 4,180 tons; Speed, 29 knots; Completed, 1917. Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; and 4 above-water 21-in. D.R. torpedo tubes.

ARGENTINE.

BATTLESHIPS.

Moreno. **Rivadavia.**

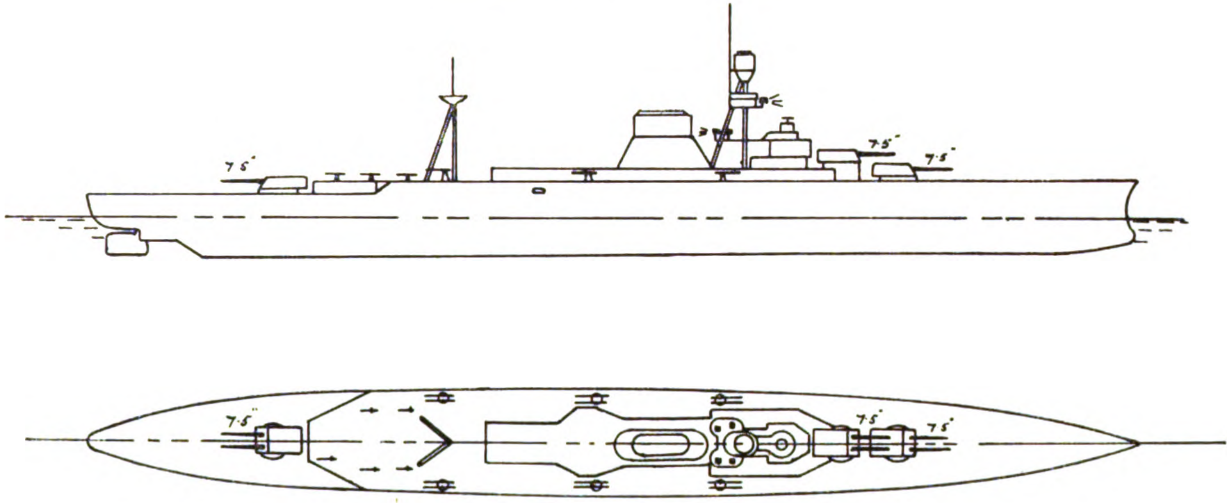


Length (extreme), 585 ft.; Length on W.L., 575 ft.; 27,720 tons; Speed, 22½ knots; Completed, 1914-15.
Armament, 12—12-in.; 12—6-in.; 4—3-pr.; 6 M.; 4 L.; 2 submerged 21-in. torpedo tubes.

ARGENTINE.

CRUISERS.

Almirante Brown. **25 Maio.**

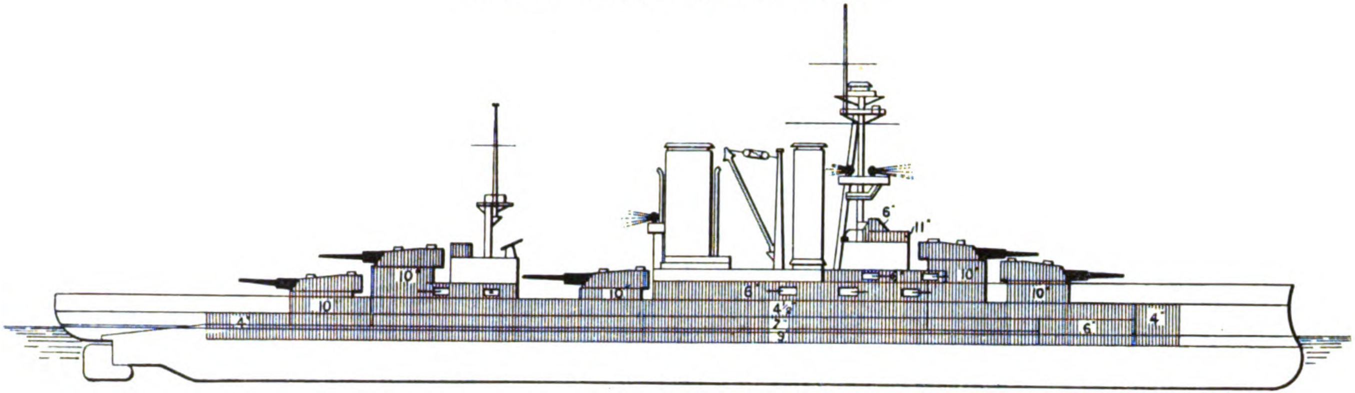


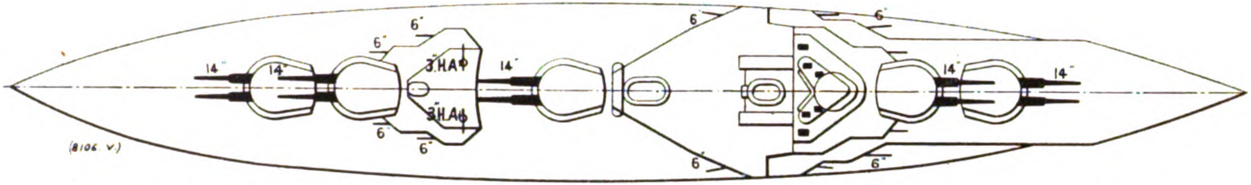
Length (extreme), 545¾ ft. ; 6,495 tons ; Speed, 32 knots. Completed 1931.
Armament, 6—7·5-in. ; 12—4-in. A.A. ; 6 Pom Poms ; 6 21-in. torpedo tubes.
1 catapult ; 2 seaplanes.

CHILE.

BATTLESHIP.

Almirante Latorre (*formerly* H.M.S. Canada).





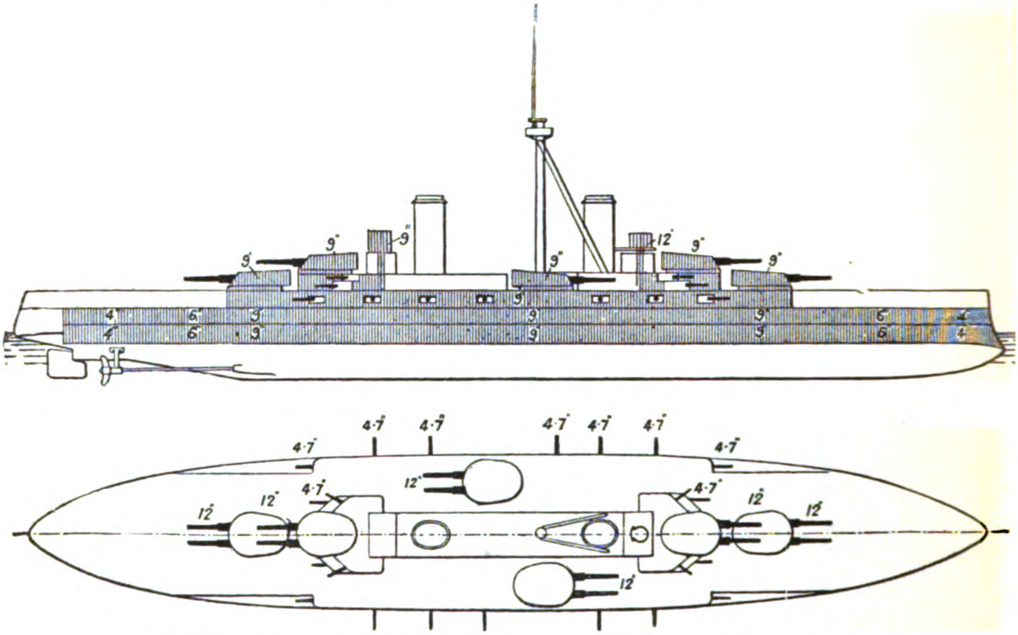
Length (extreme), 661 ft.; Length B.P., 625 ft.; 33,200 tons; Speed, 23 knots; Completed, 1915; Modernised at Devonport Dockyard 1929–31.*
Armament, 10—14-in.; 14—6-in.; 2—3-in. A.A.; 4—3-pr.; 4 submerged 21-in. torpedo tubes.

* During modernisation maintopmast has been raised and bridge platforms extended.

BRAZIL.

BATTLESHIPS.

Minas Geraes. **São Paulo.**

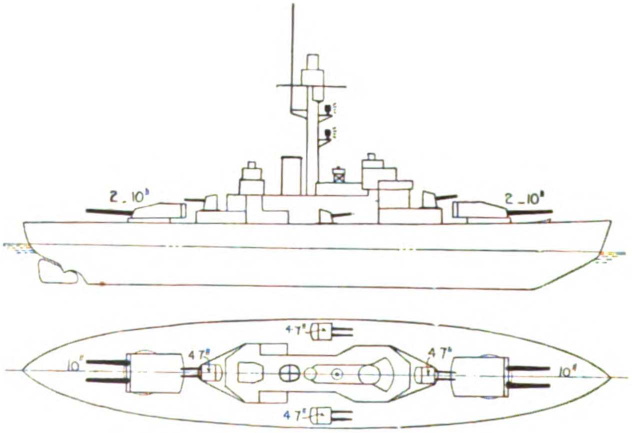


Length (extreme), 543 ft. ; Length B.P., 500 ft. ; 19,200 tons ; Speed, 21 knots ; Completed, 1909, 1910.
Armament, 12—12-in. ; 12—4·7-in. ; 6—3-pr. ; 2—3-in A.A. ; 4 M.
Overhauled and refitted at Brooklyn Navy Yard, 1921-22, and A.A. guns installed.
Correction to plan : Ten main deck 4·7-in. guns removed in 1931.

FINLAND.

ARMOURED GUNBOATS.

Väinämöinen. **Ilmarinen.**

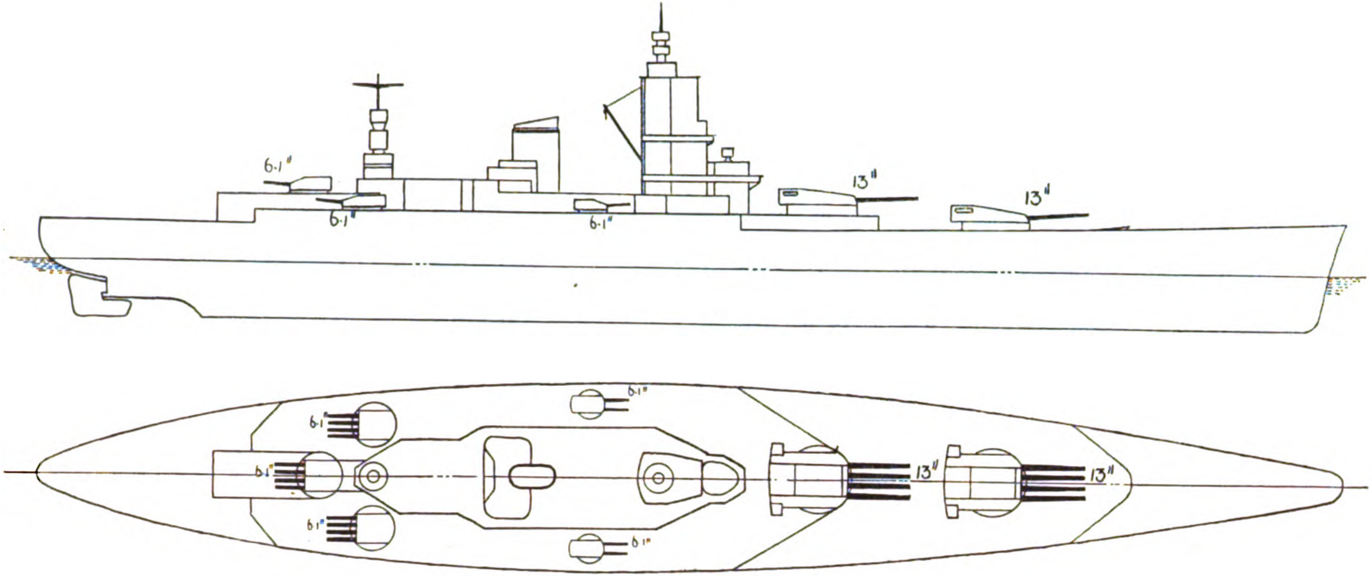


Length, 305 ft. ; 4,000 tons ; Speed, 15 knots.
Armament, 4—10-in. ; 8—4·7-in.
Completed, 1932—33.

FRANCE.

BATTLESHIP.

Dunkerque.

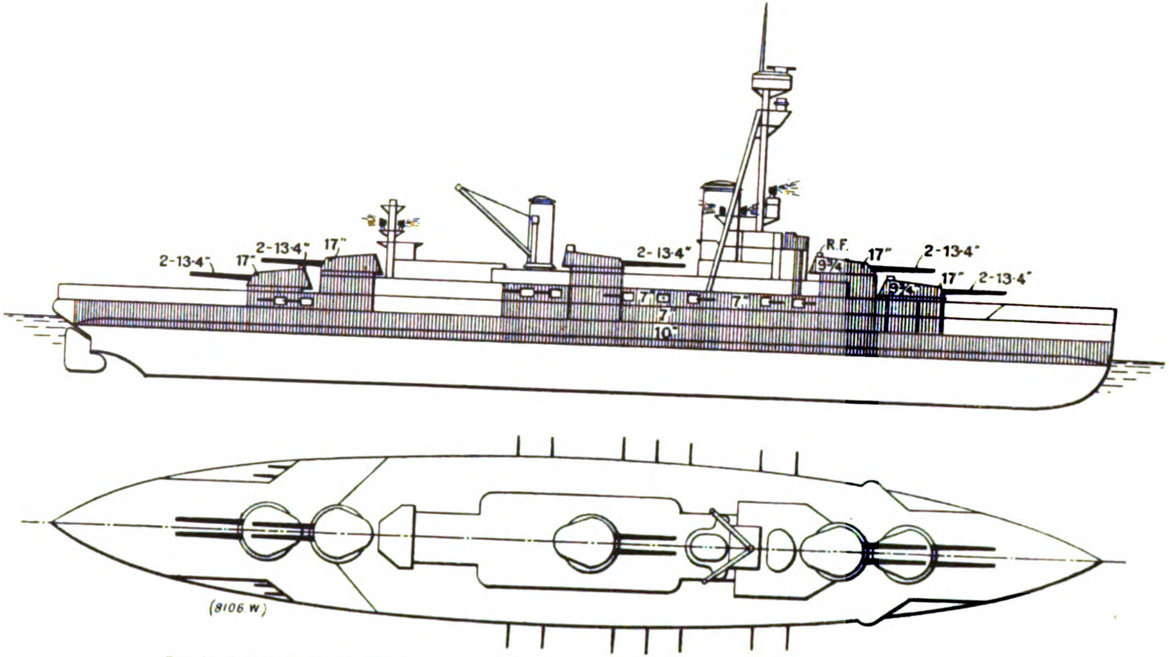


Length, 706 ft.; 26,500 tons; Speed, about 29 knots.
Armament, 8—13-in., 16—5·2-in., 40 smaller.
Building at Brest.

FRANCE.

BATTLESHIPS.

Bretagne. **Lorraine.** **Provence.**



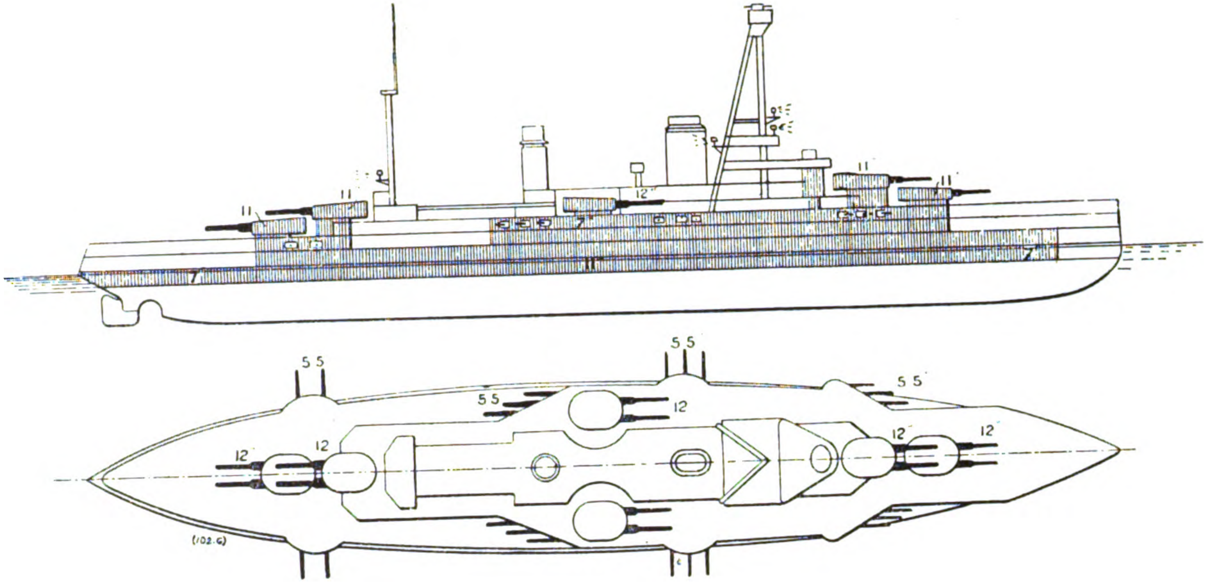
Length (extreme), 544 ft. 6 ins.; 22,189 tons; Speed, 20 knots; Completed, 1915–16; **Modernised, 1925-27.**
Converted to oil burning, 1931.
Armament, 10—13·4-in.; 18—5·5-in.; 4—3-in. A.A.; 4—3 pr.; 2—1-pr.; 4 submerged **18-in. torpedo tubes.**

Correction to plan: The ships have now **tall maintopmasts and no foretopmasts.**

FRANCE.

BATTLESHIPS.

Jean Bart. **Courbet.** **Paris.**



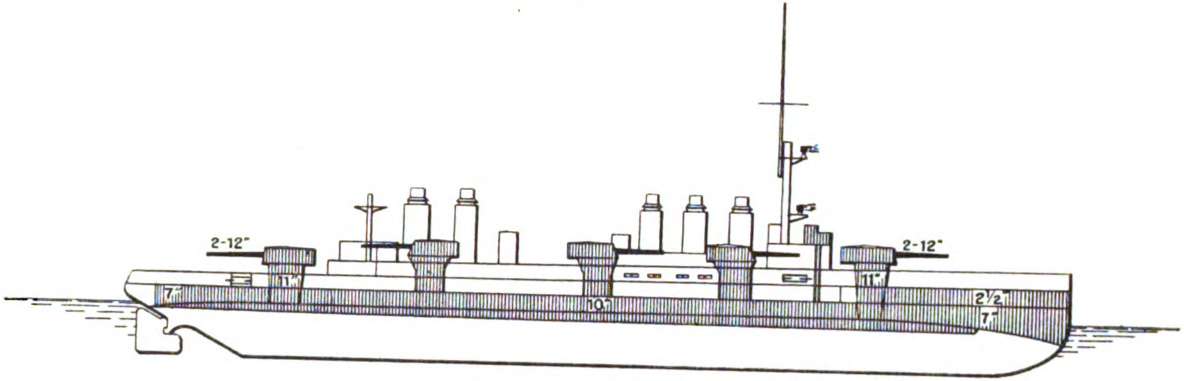
Length (extreme), 544 ft. 6 ins. ; Length B.P., 541 ft. 4 ins. ; 22,189 tons ; Speed, 20 knots ; Completed, 1913–14. Modernised in 1929. Converted to oil burning, 1931.

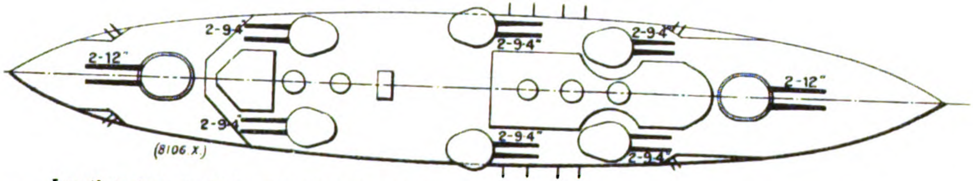
Armament, 12—12-in. ; 22—5·5-in. ; 4—3-in. A.A. ; 4—3-pr. (Courbet has 3—3-pr.) ; 2—1-pr. ; 4 submerged 18-in. torpedo tubes.

FRANCE.

BATTLESHIPS.

Condorcet. Diderot. Voltaire.



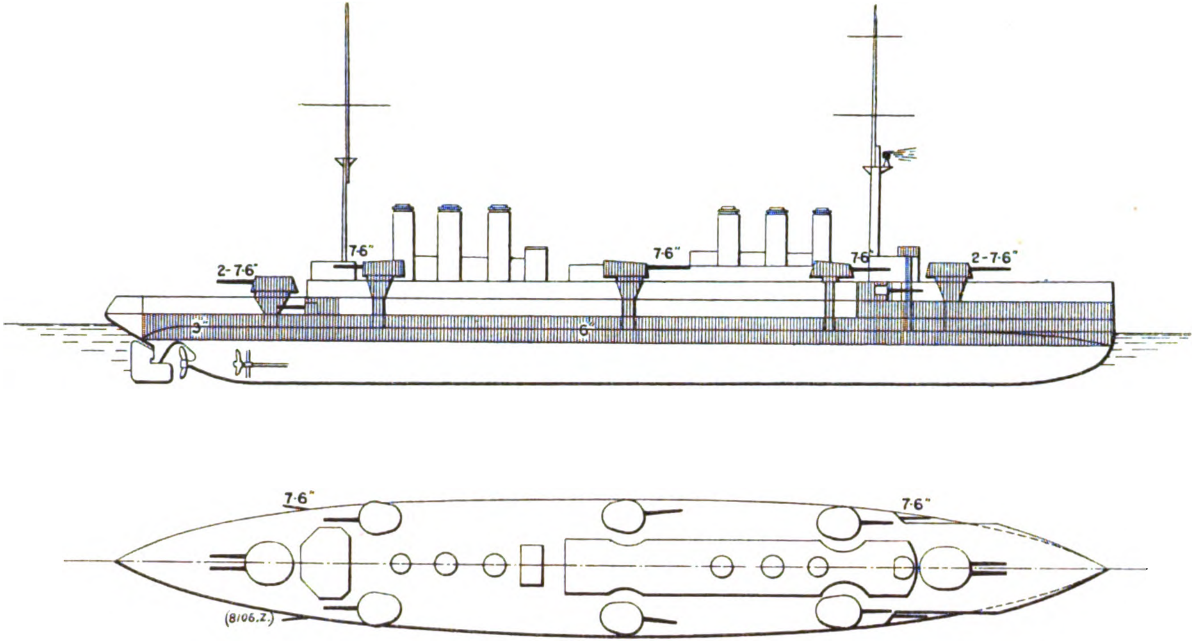


Length (extreme), 481 ft.; Length W.L., 475 ft. 9 ins.; Speed, 19¼ knots; 17,597 tons; Completed, 1911.
Armament, 4—12-in.; 12—9·4-in.; 12—3-in.; 2—3-in. A.A.; 2—3-pr. A.A. (Condorcet, 4—3-pr.); **2—1-pr.; 2 L.; 2 submerged 18-in. torpedo tubes.**
Correction to plan: Diderot has tall mainmast.

FRANCE.

ARMOURED CRUISER

Waldeck Rousseau.



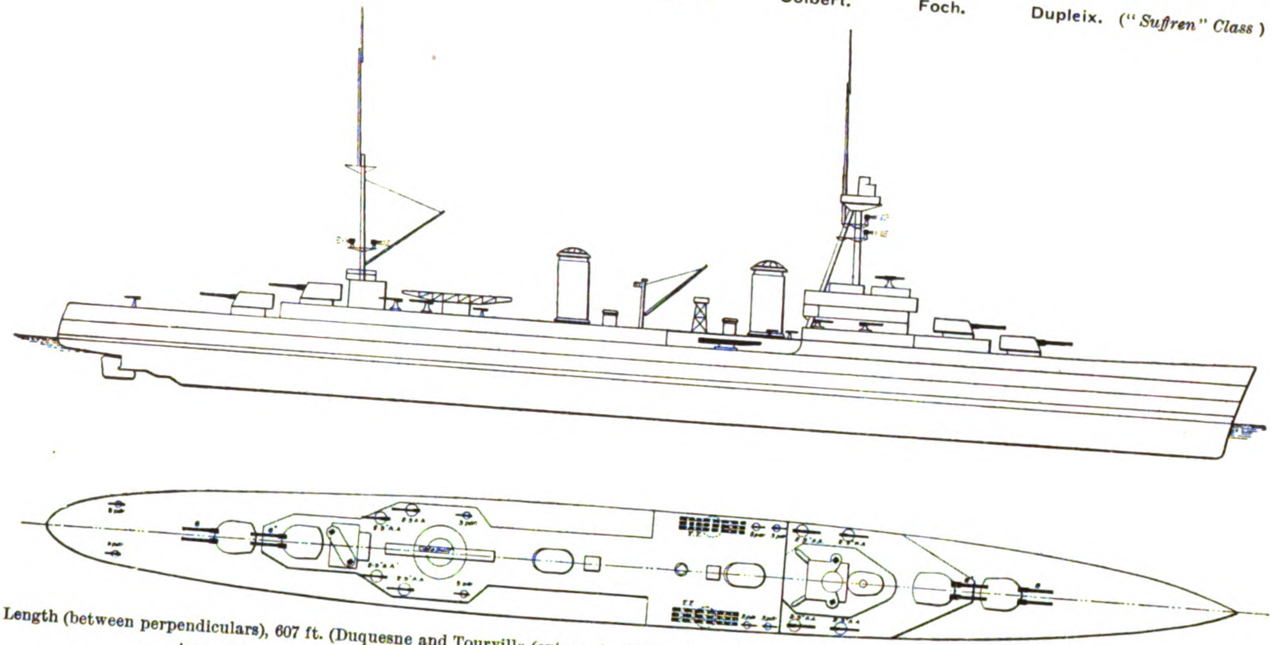
Length (extreme), 521 ft. 4 ins.; Length W.L., 515 ft.; Speed, 23 knots; 12,617 tons; Completed, 1910.
Armament, 14—7·6-in.; 10—3-in.; 10—9-pr. A.A.; 2—3 pr.; 2 M.; 2 submerged 18-in. torpedo tubes.

FRANCE.

CRUISERS.

Duquesne. **Tourville.** (*"Duquesne" Class.*)

Suffren. **Colbert.** **Foch.** **Dupleix.** (*"Suffren" Class*)



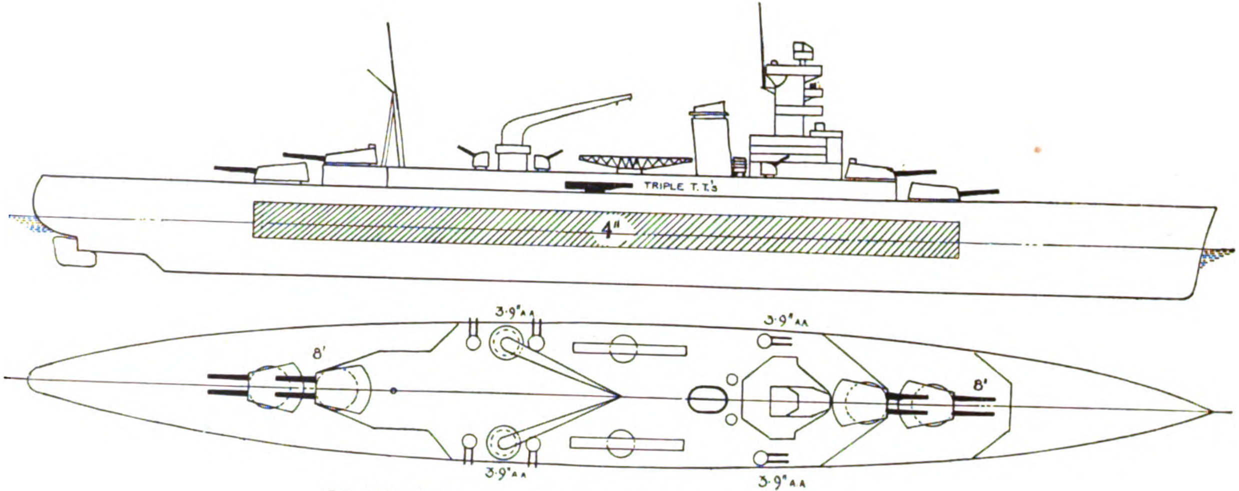
Length (between perpendiculars), 607 ft. (Duquesne and Tourville (extreme), 626 ft. 8 in.); 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33·2 knots).
Armament, 8—8-in., 8—3-in. A.A. (Dupleix, Colbert and Foch have 8—3·5-in. A.A.); 8—1-pr.; 2—triple 21-in. T.T.'s.

The above plan is for Duquesne and Tourville. The others differ slightly from this in details of bridges, cranes, catapults, etc. Suffren has 2 catapults in the position shown above. Colbert, Dupleix and Foch have tripod mainmasts, 2 catapults between the funnels and the two cranes abreast the after funnel.

FRANCE.

CRUISER.

Algérie.



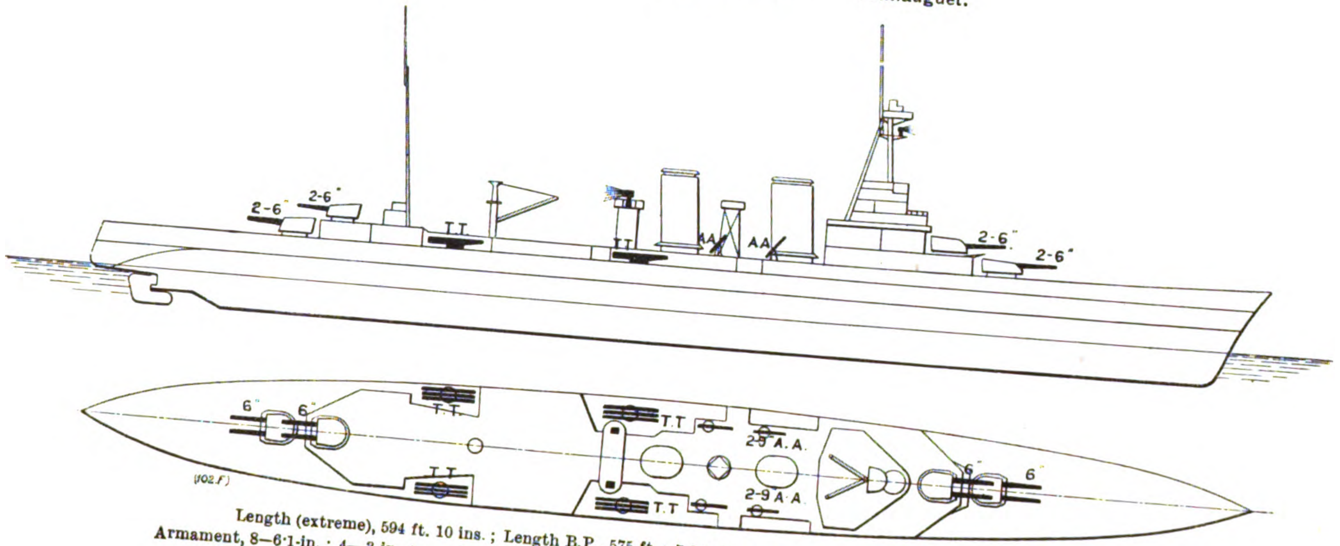
Length (between perpendiculars), 607 ft.; 10,000 tons; Speed, 31 knots.
Armament, 8—8-in.; 12—3·9-in. A.A.; 8—1·5-in.; 16 M.
2 catapults; 2 seaplanes

FRANCE.

CRUISERS.

"Duguay-Trouin" Class.

La Motte Picquet. **Duguay-Trouin.** **Primauguet.**



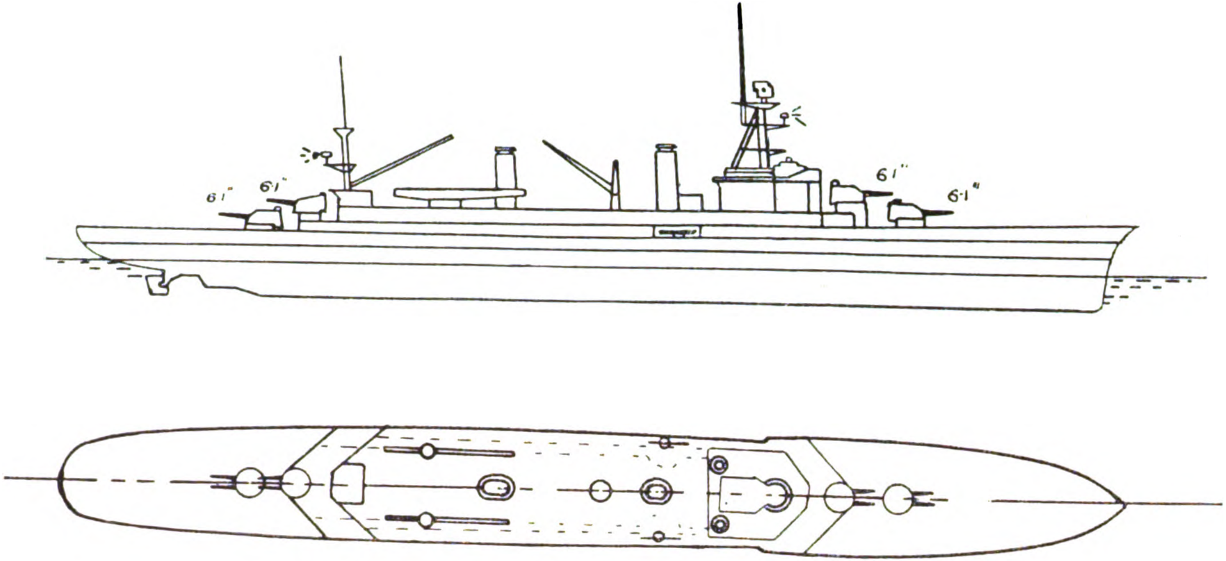
Length (extreme), 594 ft. 10 ins.; Length B.P., 575 ft.; 7,249 tons; Speed, 33 knots. Completed, 1926–27.
Armament, 8—6·1-in.; 4—3-in. A.A.; 2–3-pr.; 2 M.; 1 L.; 4 triple torpedo tubes (21·7-in. torpedoes); catapult; 2 seaplanes.

NOTE.—Reported to have protection to magazines.

FRANCE.

TRAINING CRUISER.

Jeanne d'Arc.



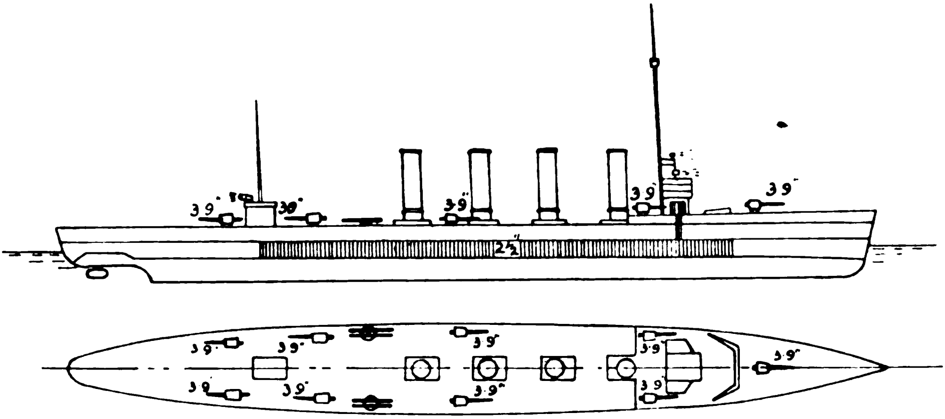
Length (extreme), 557 ft. 8 ins.; 6,496 tons; Speed, 26 knots; Completed 1931.
Armament, 8—6·1-in.; 4—3-in. A.A.; 2—1·6-in.; 2 M.; 2—21·7-in. torpedo tubes.
2 seaplanes.

Correction to plan: The catapults have been removed.

FRANCE

LIGHT CRUISER.

Thionville (*ex-Austrian* Novara).

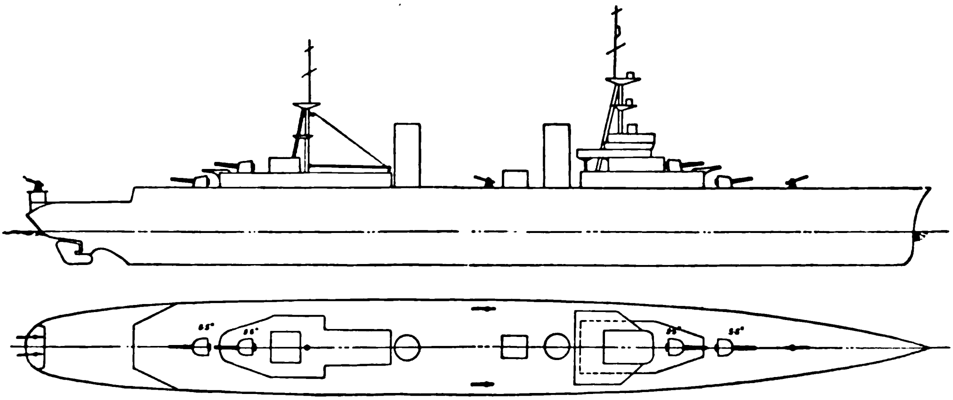


Length (extreme), 428 ft. 7 ins. ; 2,922 tons ; Speed, 27 knots.
Armament, 9—3·9-in. ; 2—3-in. A.A. ; 2 twin above-water torpedo tubes.
Correction to plan : The torpedo tubes are fitted right aft.

FRANCE.

CRUISER MINELAYER.

Pluton.

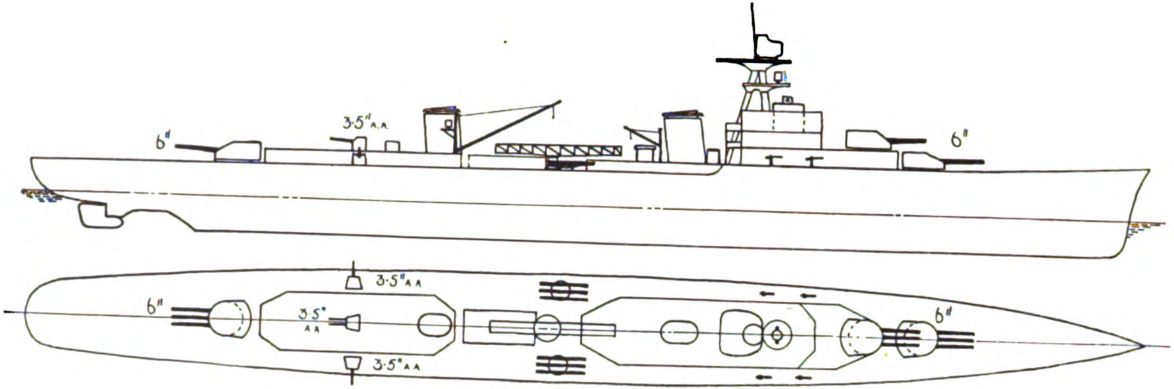


Length (between perpendiculars), 472 ft. ; 4,773 tons ; Speed, 30 knots ; Completed, 1931.
Armament : 4—5·5-in., 10—1-pdr. ; 12 M. ; 1,000 mines.

FRANCE.

CRUISER MINELAYER.

Emilé Bertin.



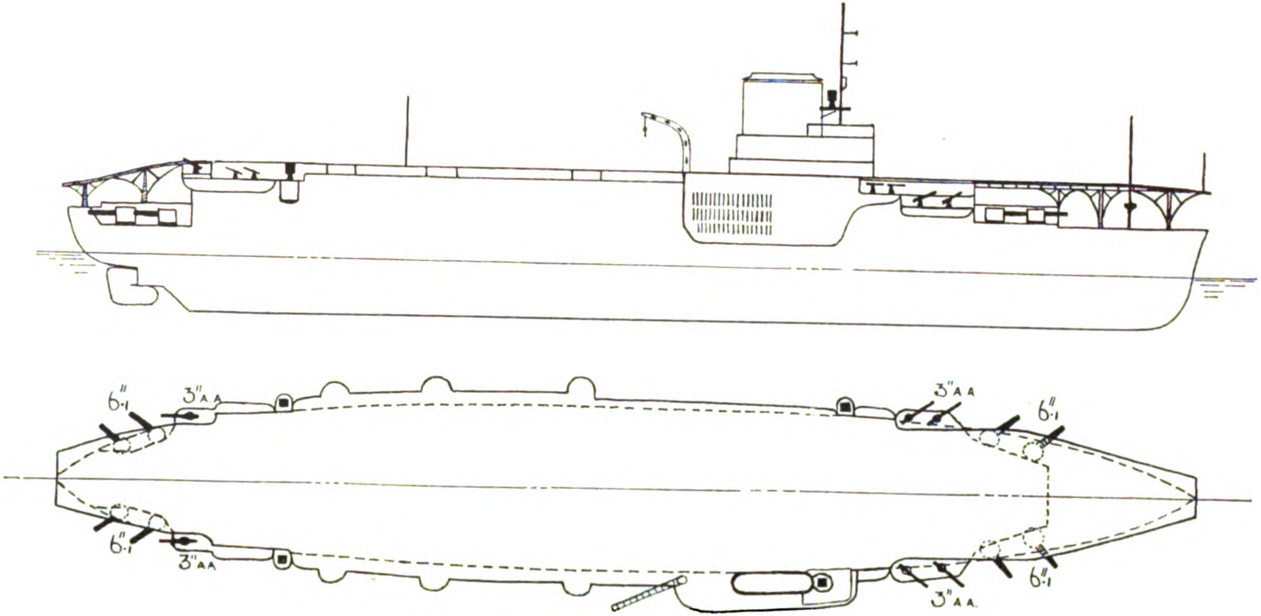
Length (extreme), 580 ft. ; 5,886 tons ; Speed, 34 knots.
Armament, 9—6-in. ; 4—3·5-in. A.A. ; 8—1-pr. ; 250 mines.
1 catapult ; 1 aircraft.

Building at Penhoet, St. Nazaire.

FRANCE.

AIRCRAFT CARRIER.

Béarn.

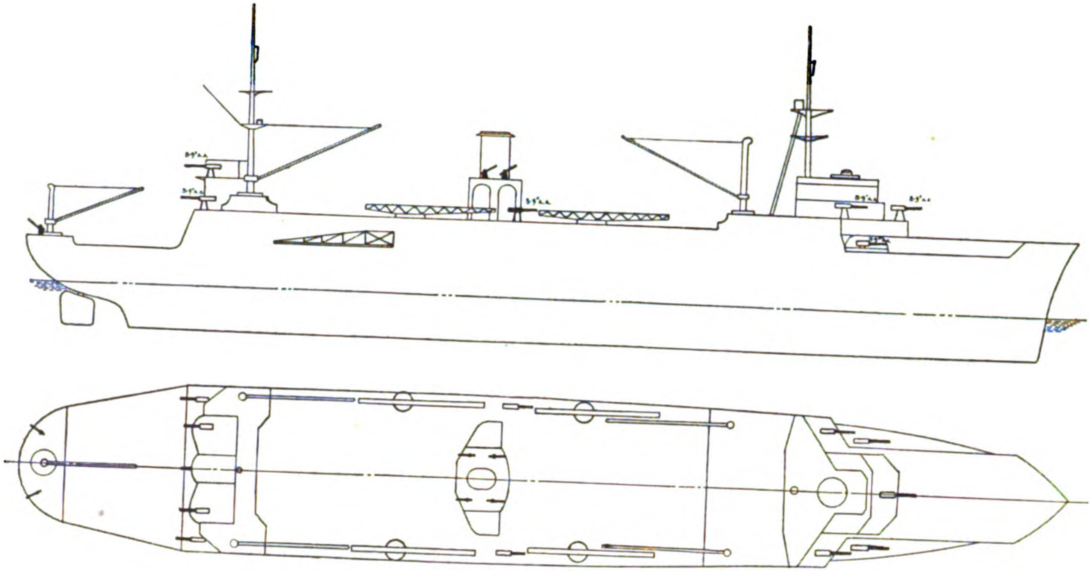


Length (extreme), 597 ft. ; 22,146 tons ; Speed, 21 5 knots ; Completed, 1928.
Armament, 8—6·1-in. ; 6—3-in. A.A. ; 8—1-pr. A.A. ; 12 M. A.A. ; 4—21·7-in torpedo tubes ; 41 planes.

FRANCE.

AVIATION TRANSPORT.

Commandant Teste.

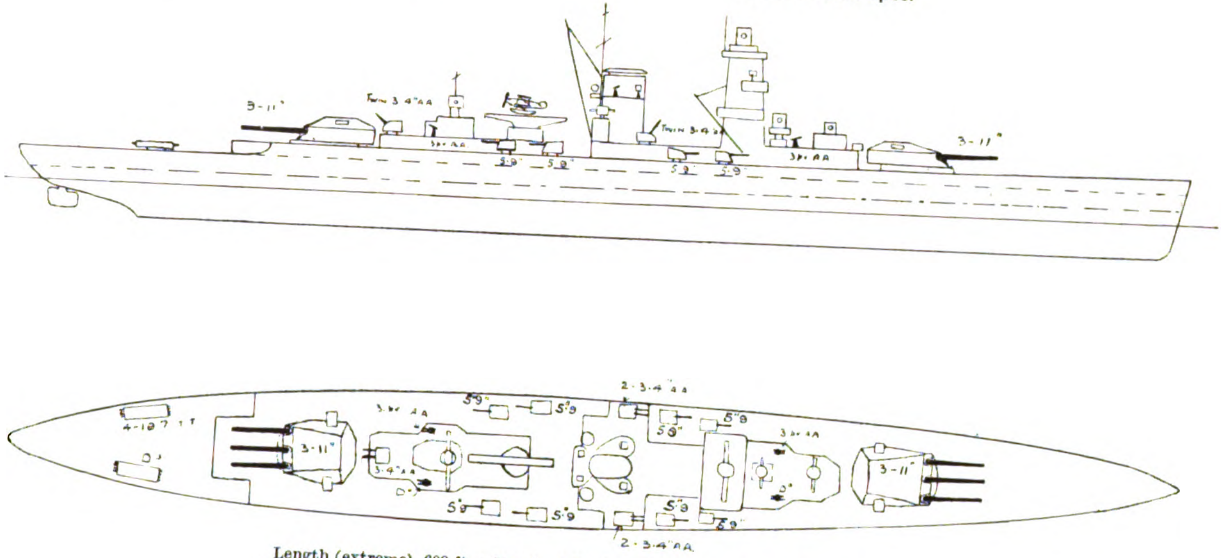


Length (extreme), 548 ft.; 10,000 tons; Speed, 20½ knots; Completed, 1932.
Armament, 12—3·9-in. A.A.; 8—3-pdr. A.A.; 12 M.; 20 planes.

GERMANY.

ARMOURED SHIPS.

Admiral Scheer. **Admiral Graf Spee.**

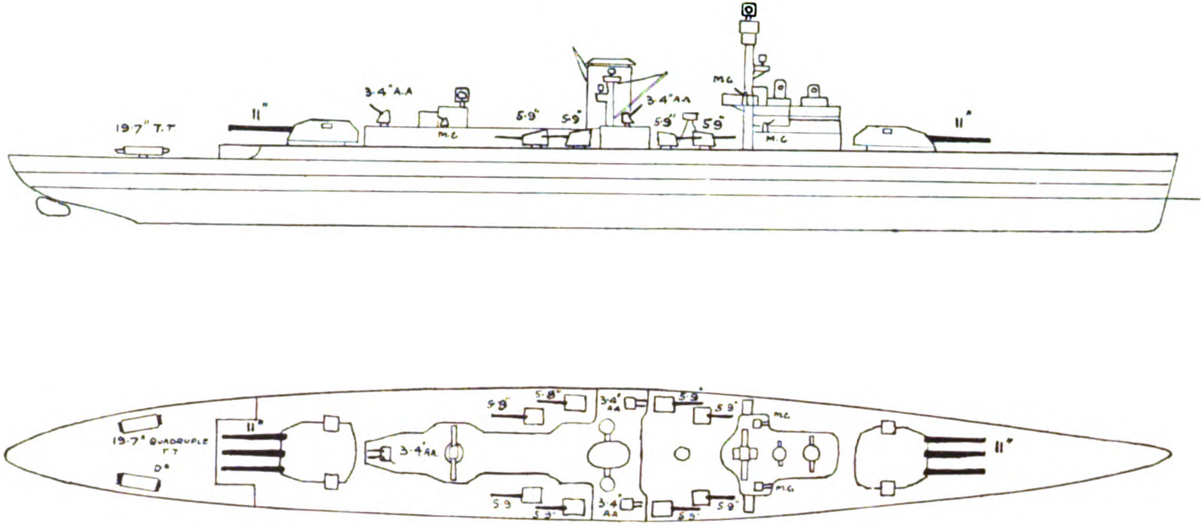


Length (extreme), 609 ft. ; Standard displacement, 10,000 tons : Speed, 26 knots.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. ; 8 M.G. ; 8—19·7 in. torpedo tubes.
Admiral Scheer completed 1935 : **Admiral Graf Spee completed 1936.**

GERMANY.

ARMOURED SHIP.

Deutschland.

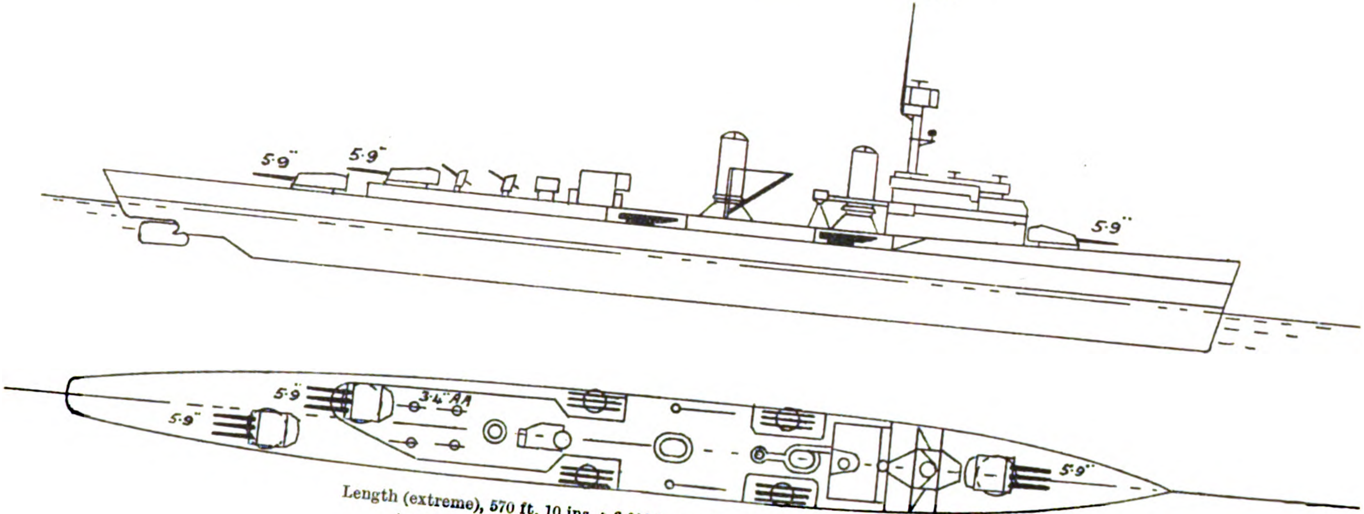


Length (extreme), 609 ft. ; Standard displacement, 10,000 tons ; Speed, 26 knots ; Completed, 1933.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. ; 8 M.G. ; 8—19·7 in. torpedo tubes.

GERMANY.

LIGHT CRUISERS.

Königsberg. Karlsruhe. Köln.

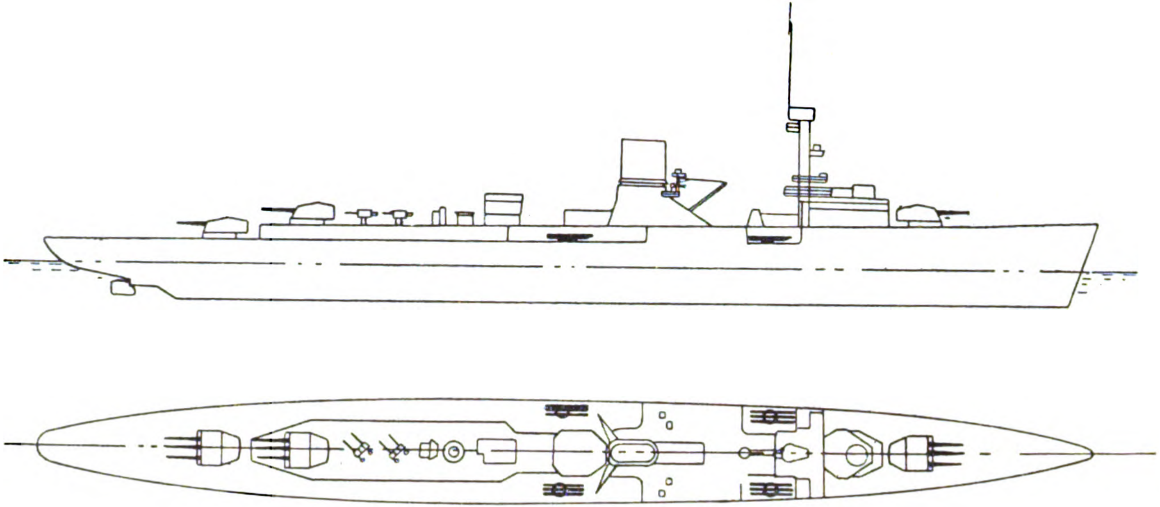


Length (extreme), 570 ft. 10 ins. ; 6,000 tons ; Speed, 32 knots ; Completed, 1929–30.
Armament, 9—5·9-in. ; 4—3·4-in. A.A. ; 4 triple 19·7-in. torpedo tubes.

GERMANY.

LIGHT CRUISER,

Leipzig.

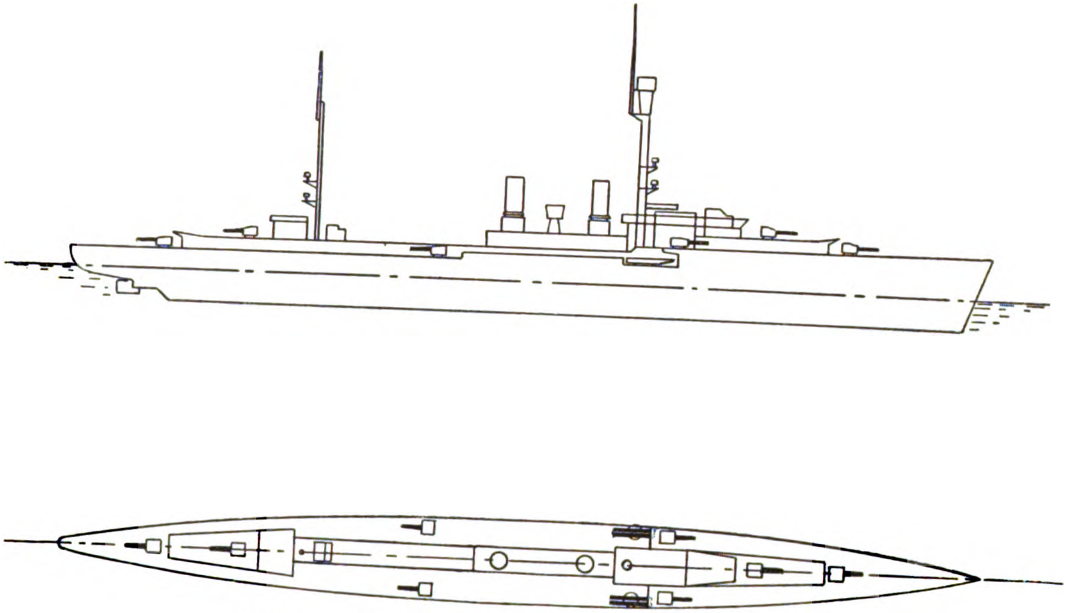


Length W.L., 543 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1931.
Armament, 9—5·9 in.; 4—3·4 in. A.A.; 4 triple 19·7-in. torpedo tubes.

GERMANY.

LIGHT CRUISER.

Emden.



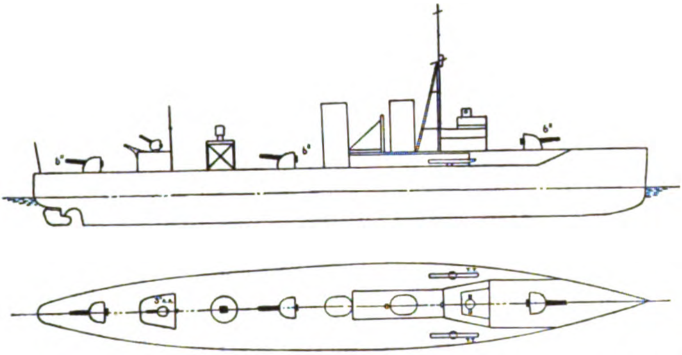
Length (extreme), **510 ft. 2 ins.; 6,000 tons; Speed, 29 knots; Completed, 1925.**
Armament. 8—5·9-in.; 2—3·4-in. A.A.; 4—19·7-in. torpedo tubes in twin mountings.
The 8—5·9-in. guns will be mounted in twin mountings, **2 forward and** 2 aft, when **the mountings are ready.**

Correction to plan: The forward funnel is higher than the after one.

GREECE.

CRUISER.

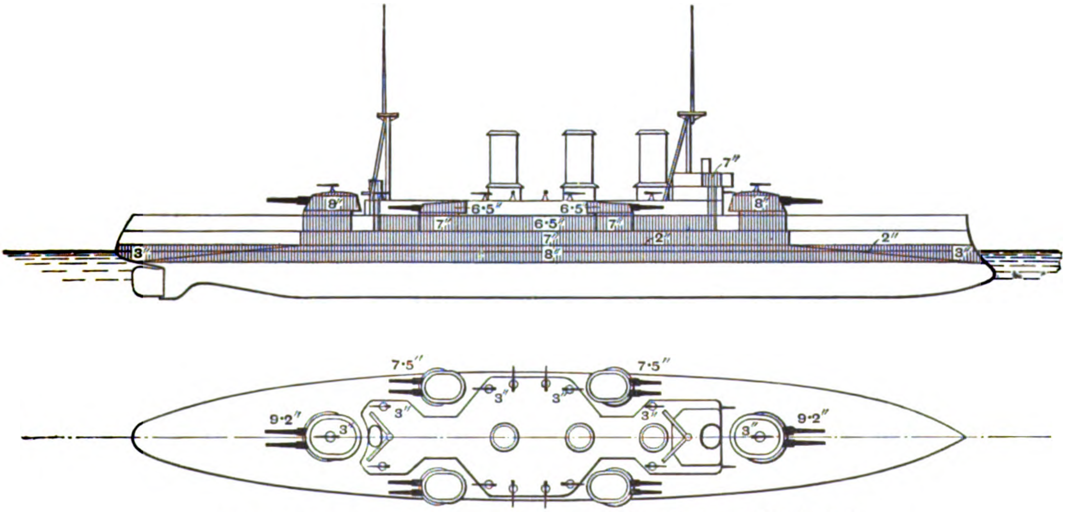
Helle.



Length, 322 ft. ; 2,083 tons ; Speed, 20 knots ; Completed, 1914 ; Reconstructed, 1929.
Armament, 3—6-in.; 1—3-in. A.A. ; 110 mines ; 2—18-in. torpedo tubes.

ARMOURED CRUISER.

Giorgios Averoff.

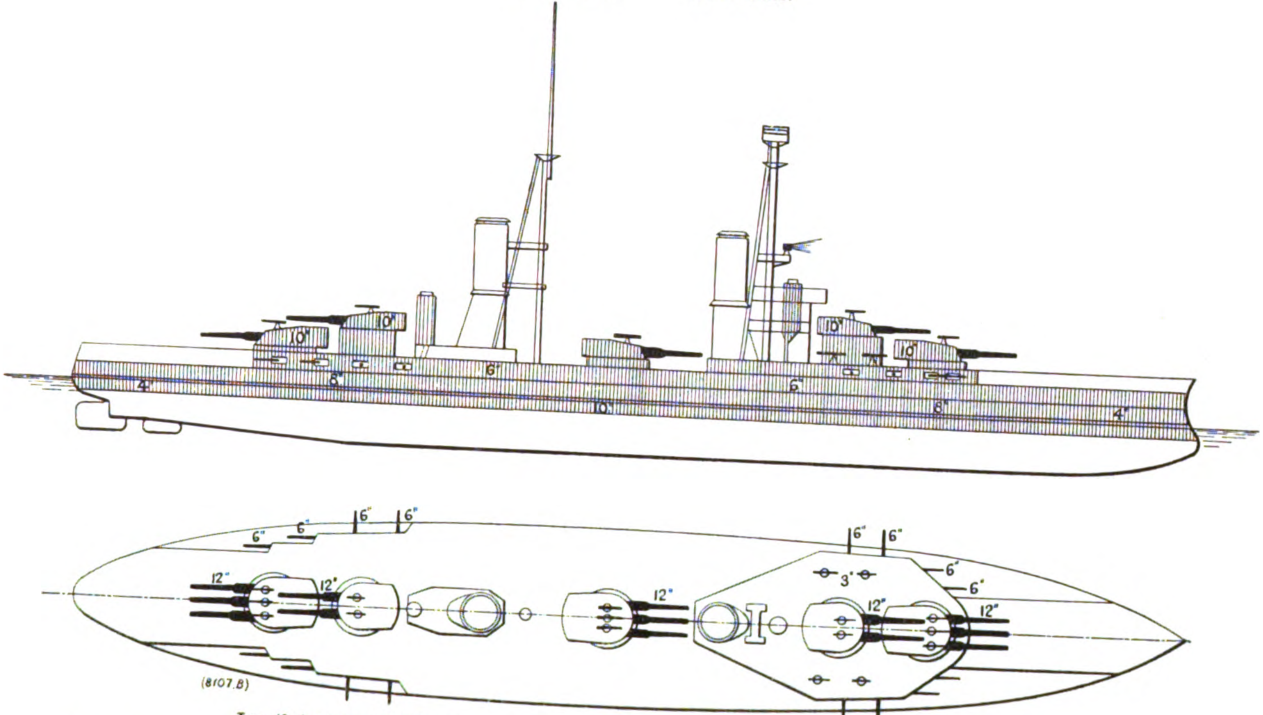


Length, 462 ft. ; 9,301 tons ; Speed, 24 knots ; Completed, 1911. Refitted, 1927.
Armament, 4—9·2-in. ; 8—7·5-in. ; 16—3-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2 M. ; 3 submerged 18-in. torpedo tubes.

ITALY.

BATTLESHIPS.

Andrea Doria. Caio Duilio.

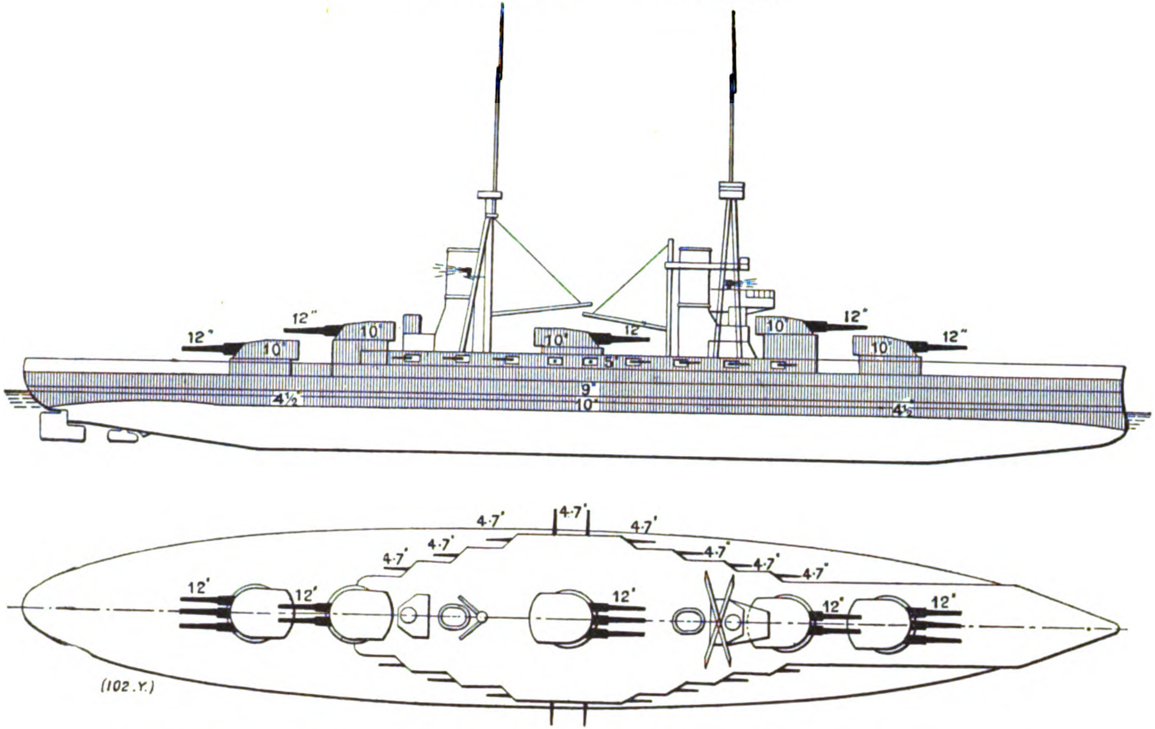


Length (extreme), 575 ft. 9 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; Completed, 1915.
Armament, 13—12-in. ; 16—6-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 6 M. ; 4 L. ; 2—18-in. torpedo tubes.

ITALY.

BATTLESHIPS.

Conte di Cavour. **Giulio Cesare.**

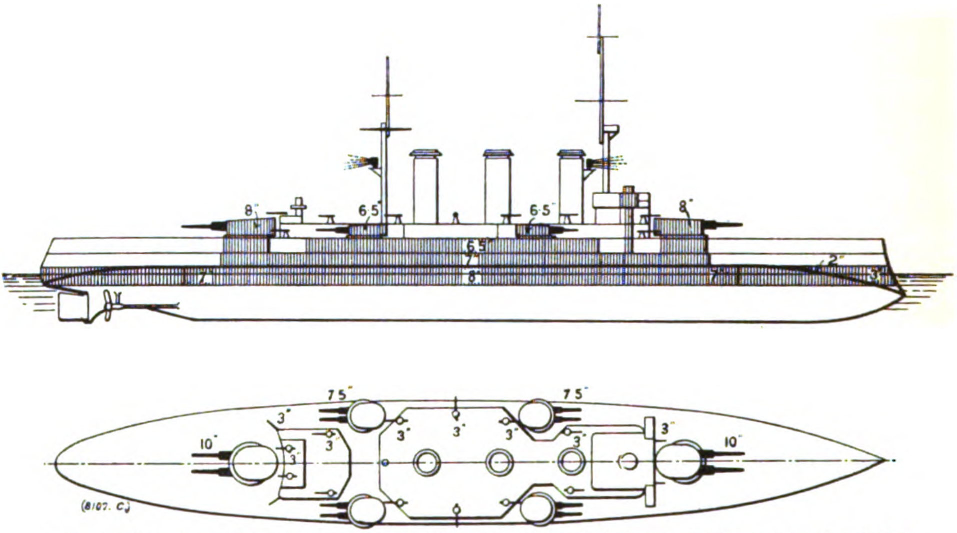


Length (extreme), 577 ft. 4 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; 22,144 tons ; Completed, 1914-1915.
Armament, 13—12-in. ; 18—4·7-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 2 M. ; 4 L.
A fixed catapult is mounted on port side of Forecastle Deck forward.

ITALY.

ARMOURED CRUISER.*

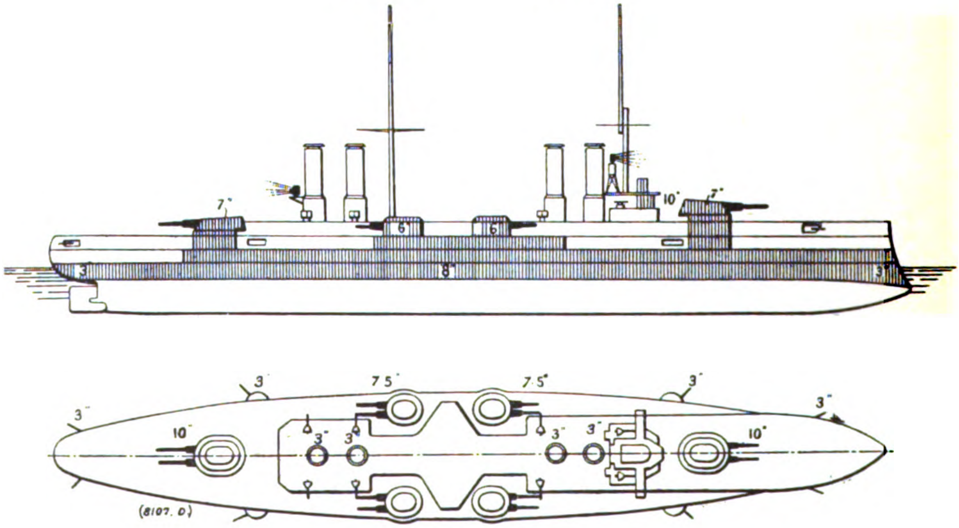
Pisa.



Length (extreme), 460 ft. 11 ins. ; Length B.P., 426 ft. 6 ins. ; Speed, 22½ knots ; 8,759 tons ; Completed, 1909.
Armament, 4—10-in. ; 8—7·5-in. ; 12—3-in. ; 6—3-in. A.A. ; 4 M. ; 2 L. ; 2—18-in. torpedo tubes.
Cadets' Training Ship.

ARMOURED CRUISERS *

S. Giorgio. S. Marco.



Length (extreme), 462 ft. 2 ins. ; Length B.P., 429 ft. 10 ins. ;
Speed, 22·5 and 23 knots ; 9,232 and 9,350 tons ; Completed, 1910 and 1911.
Armament, 4—10-in. ; 8—7·5-in. ; 10—3-in. ; 6–3-in. A.A. ; 2—3-pr. ; 6 M. ; 2 L. ; 2—18-in. torpedo tubes.

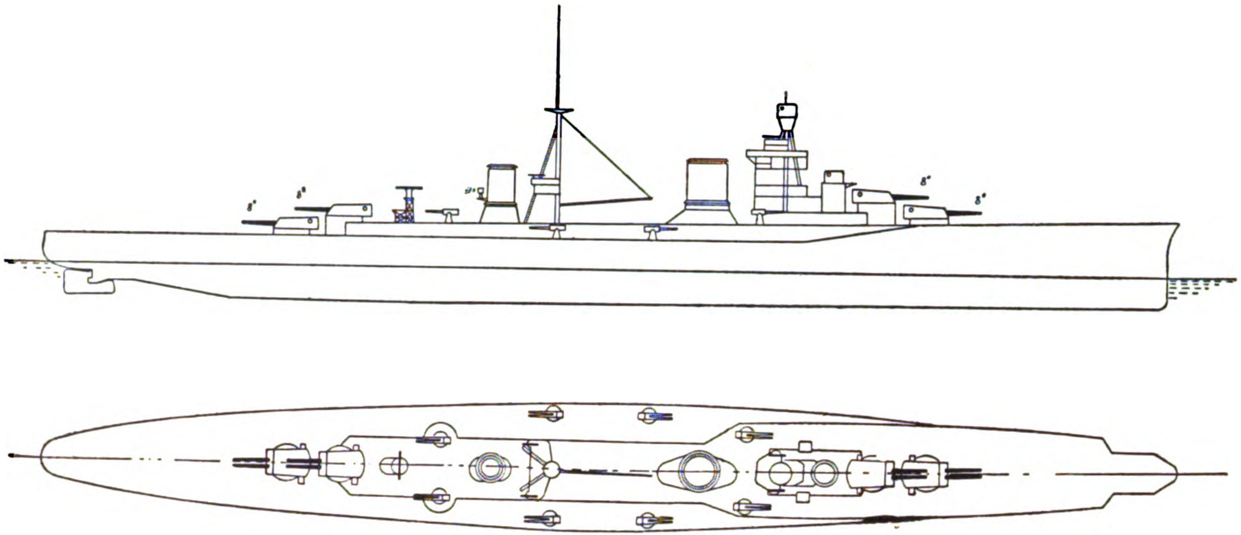
* Classified as Battleships, 2nd class, in Italian official tests.

ITALY.

CRUISER.

Modified "Trento" Class.

Bolzano.



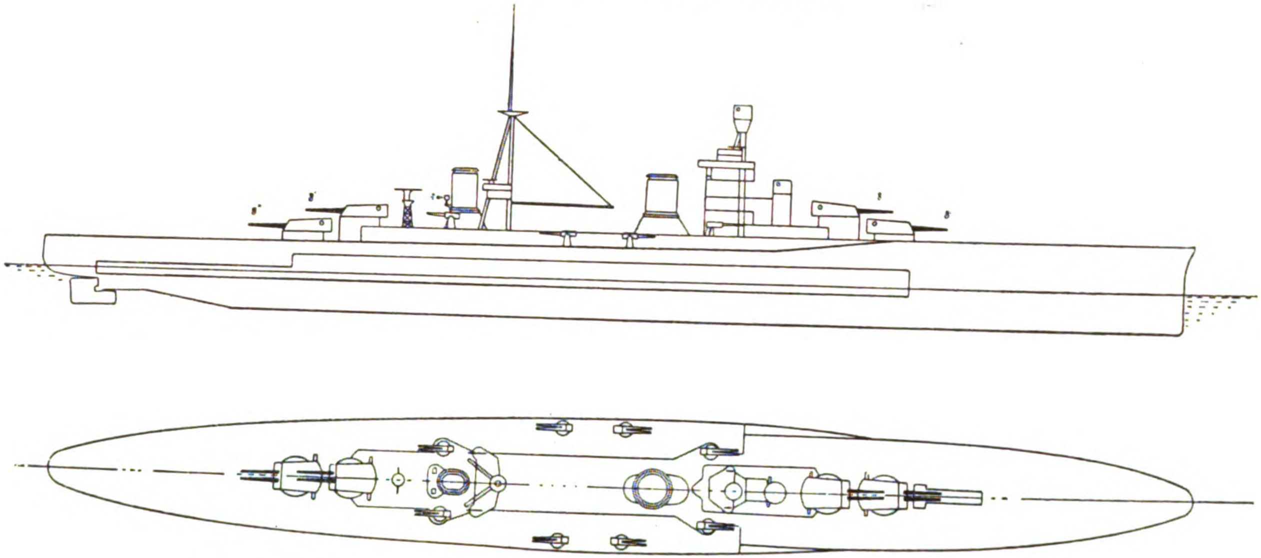
Length B.P., 644 ft.; 10,000 tons; Completed, 1932.
Armament, 8—8-ins.; 16—3·9-in. A.A.; 12 smaller; 2 catapults.
8—21-in. torpedo tubes may be fitted.

ITALY.

CRUISERS.

"*Zara*" *Class*

Pola. **Zara.** **Fiume.** **Gorizia.**

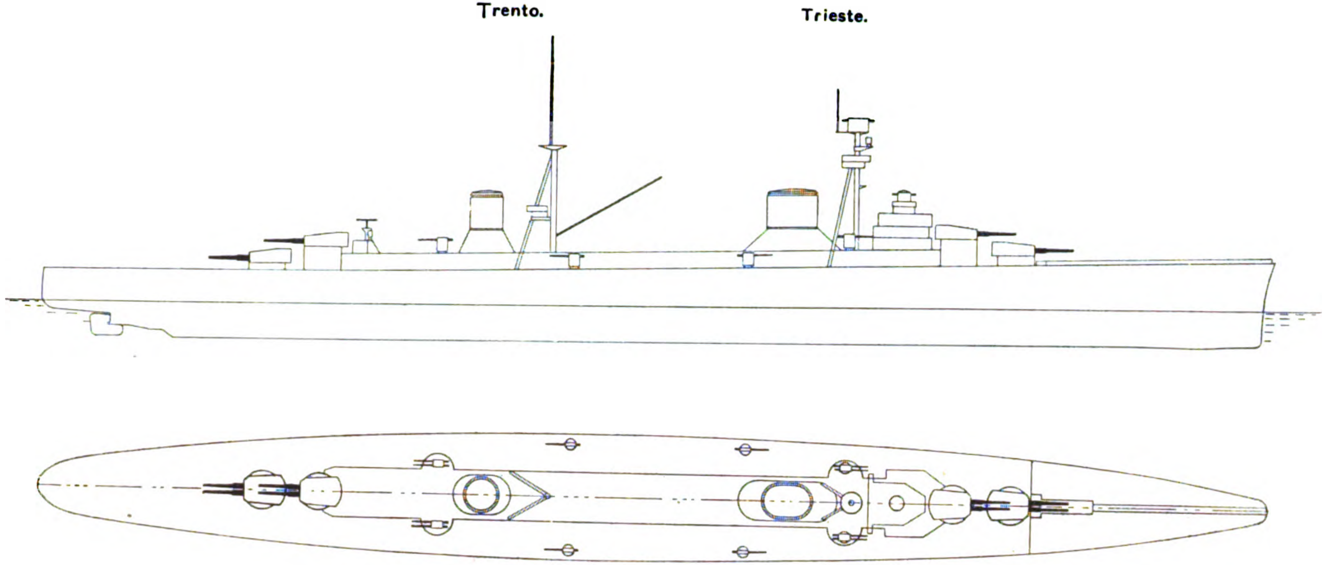


Length: Zara and Fiume, 599 ft. 5 ins.; Pola, 600 ft.; Gorizia, 590 ft. 9 ins.; 10,000 tons; Speed, 32 knots.
Armament, 8—8-in.; 16—3·9-in.; 12 smaller.
1 catapult; 2 aircraft.

ITALY.

CRUISERS.

"Trento" Class.



Length (extreme), 646 ft. 2 ins. ; 10,000 tons ; Speed, 35 knots ; Completed, 1929.
Armament, 8—8-in. ; 16—3·9-in. ; 4—1 pdr. ; 8 M.G. ; 4 twin torpedo tubes.
1 catapult ; 2 aircraft.

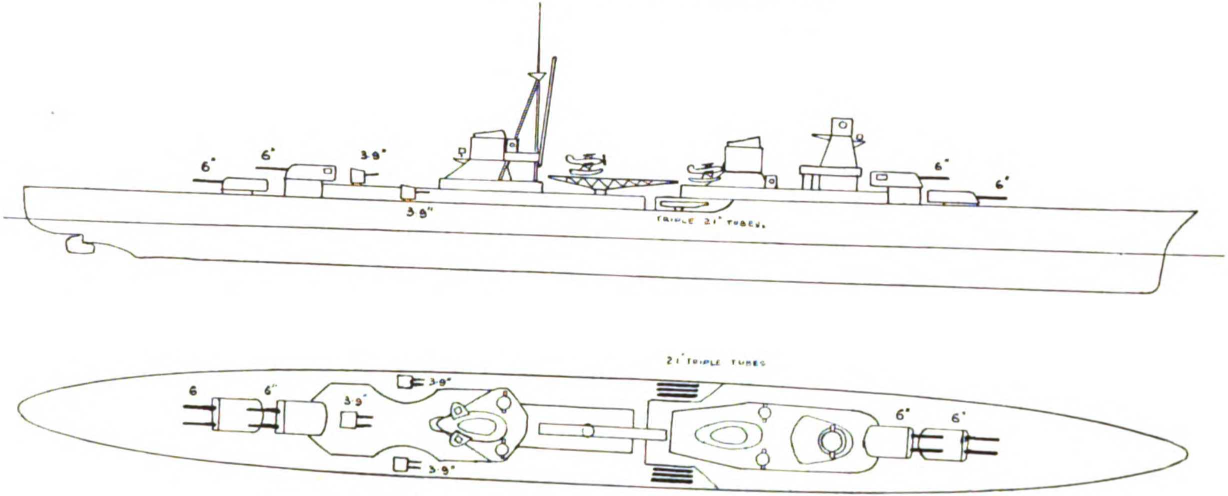
Correction to plan : The 4-in. guns between the funnels are twin guns.

ITALY.

CRUISERS.

"Attendolo" Class.

Eugenio di Savoia and Filiberto Duca d'Aosta.



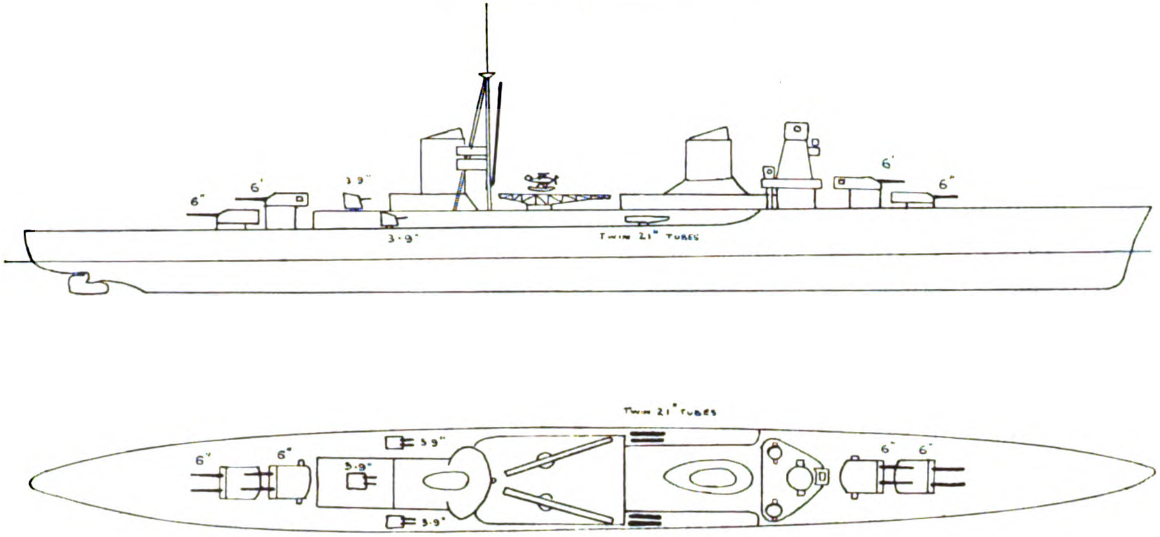
Length (extreme), 613 ft. 4 ins.; 6,791 tons; Speed, 36½ knots.
Armament, 8—6-in.; 6—3·9 in.; 8—1 pr. A.A.; 8 M.G.; 2 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.

ITALY.

CRUISERS

"Condottieri" Class.

·Montecuccoli and Muzio Attendolo.



Length (extreme), 597 ft. ; 5,857 tons ; Speed, 37 knots : Completed, 1935.
Armament, 8—6-in. ; 6—3·9-in. A.A. : 8 M.G. : 2 twin 21-in. torpedo tubes ; 2 catapults ; 2 aircraft.

ITALY.

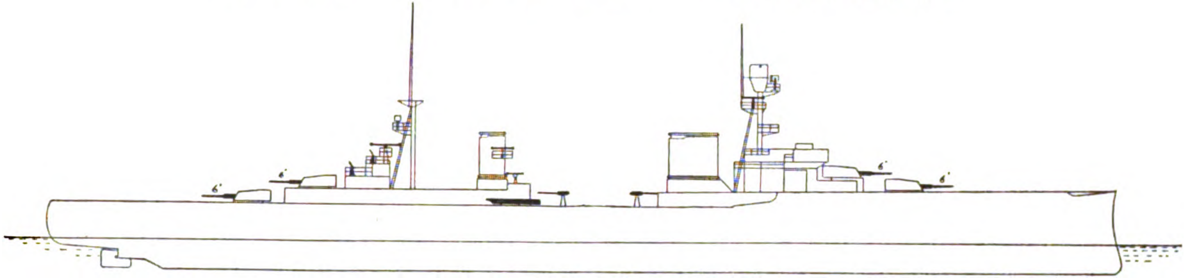
CRUISERS.

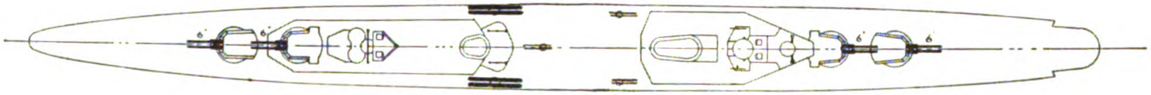
"*Condottieri*" *Class.*

Armando Diaz.*
Luigi Cadorna.*

Alberto di Guissano.
Alberico di Barbiano.

Bartolomeo Colleoni.
Giovanni della Bande Nere.





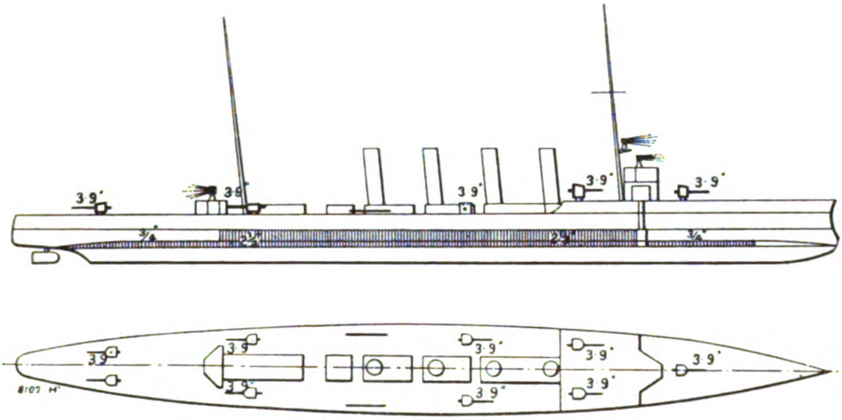
**Length (extreme), 556 ft. 5 ins.; 5,069 tons (*554 ft. 6 ins., 5,008 tons); Speed, 37 knots; Completed, 1931–33.
Armament, 8—6-in.; 6—3·9-in. A.A.; and smaller guns; 4 torpedo tubes.
1 catapult and 2 seaplanes.**

**Corrections to plan: The bridge and foremast have been modified. The after twin 3·9-in. A.A. gun is at the superstructure level on a raised platform.
* In the Armando Diaz and Luigi Cadorna the mainmast is forward of the after funnel, the torpedo tubes are abreast the forward funnel, and the positions of the twin A.A. guns are reversed, the foremost gun being at forecastle deck level and the two after guns at upper deck level.**

ITALY.

LIGHT CRUISERS.*

Venezia (*ex-Austrian* **Saida**). **Brindisi** (*ex-Austrian* **Heligoland**).

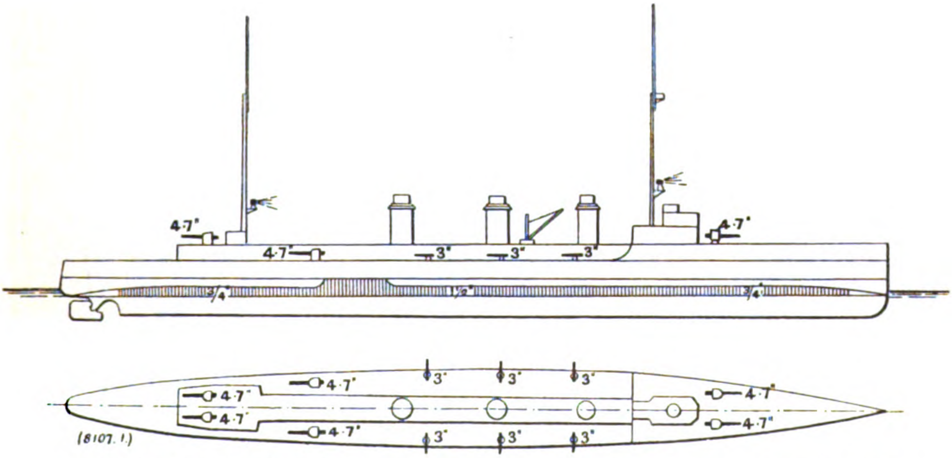


Length (extreme), 430 ft.; Length W.L., 416 ft. 9 ins.; Speed, 27 knots; 2,756 tons; Completed, 1914.
Armament, 9—3·9-in.; 1—3-in. A.A.; 170 mines; 4 torpedo tubes.

NOTE.—Thionville (*ex-Austrian* Novara), sister ship, allocated to France.

LIGHT CRUISER.*

Quarto.



Length (extreme), 431 ft. 9 ins.; Length B.P., 413 ft. 5 ins.; Speed, 28 knots; 2,903 tons; Completed, 1913.
Armament, 6—4·7-in.; 6—3-in.; 2—2-pr. A.A.; 2 above-water 18-in. torpedo tubes; 126 mines.

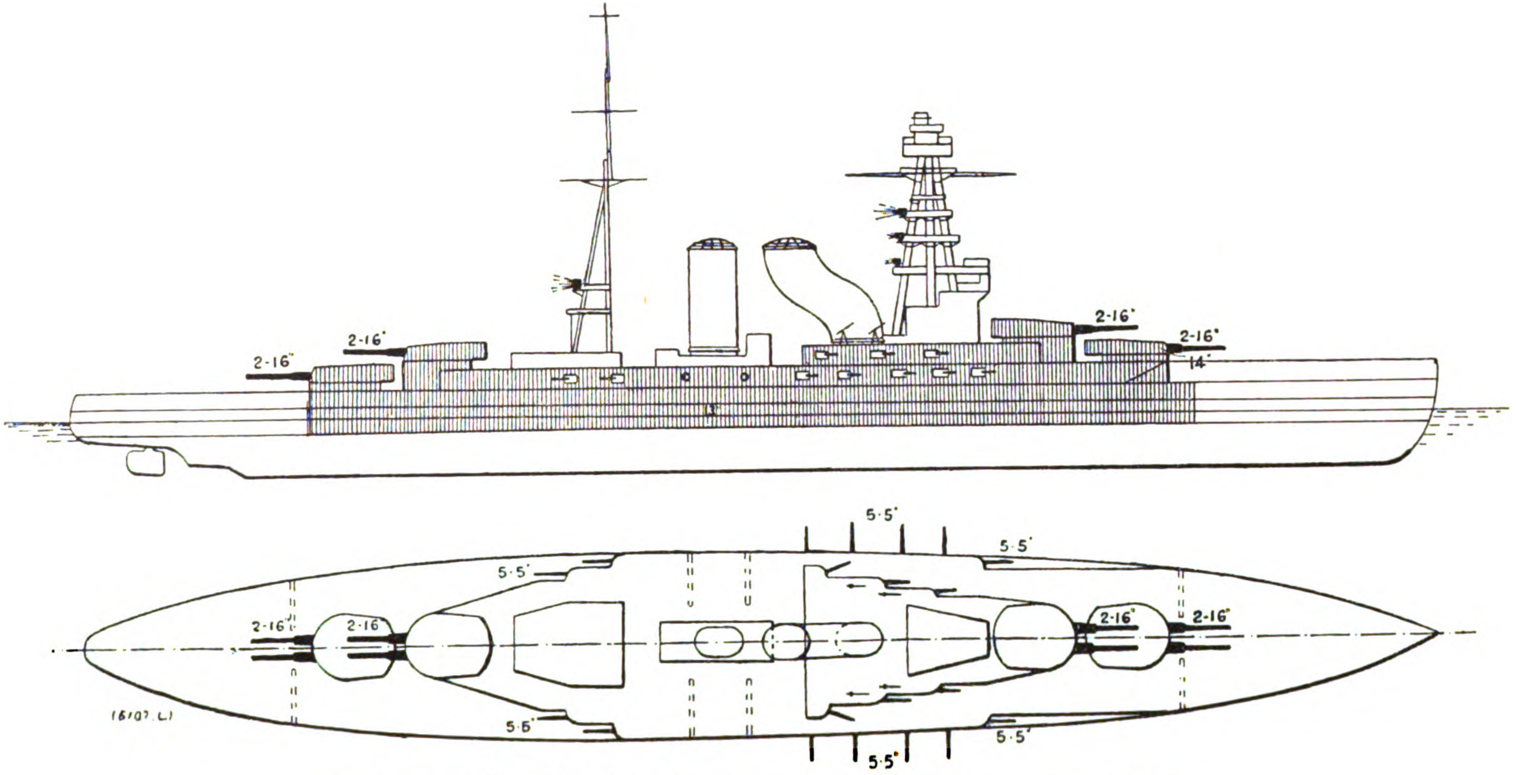
* Classified as Scouts in Italian official tests.

JAPAN.

BATTLESHIPS.

"Nagato" Class.

Nagato. Mutsu.



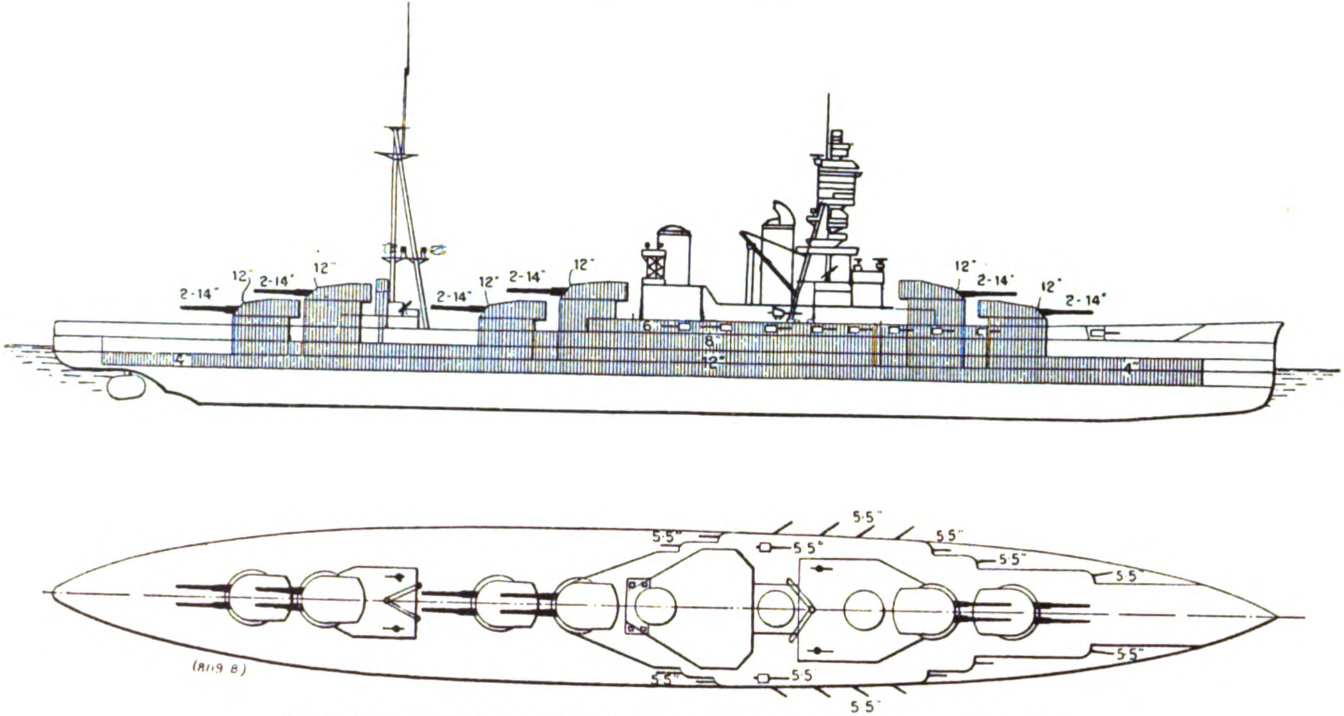
Length (extreme), 700 ft.; Length B.P., 660 ft. 7 ins.; Speed, 23 knots; 32,720 tons; Completed, 1920-1921. Armament, 8—16-in.; 20—5·5-in.; 4—5-in. A.A.; 4 above-water and 4 submerged 21-in. torpedo tubes.

JAPAN.

BATTLESHIPS.

"*Fuso*" *Class.*

Ise. **Hyuga.**



Length (extreme), 683 ft.; Length B.P., 640 ft.; Speed, 23 knots; 29,990 tons; Completed, 1917-18.
Armament, 12—14-in.; 20—5·5-in.; 4—3-in. A.A. 6 submerged 21-in. torpedo tubes.
2 seaplanes.

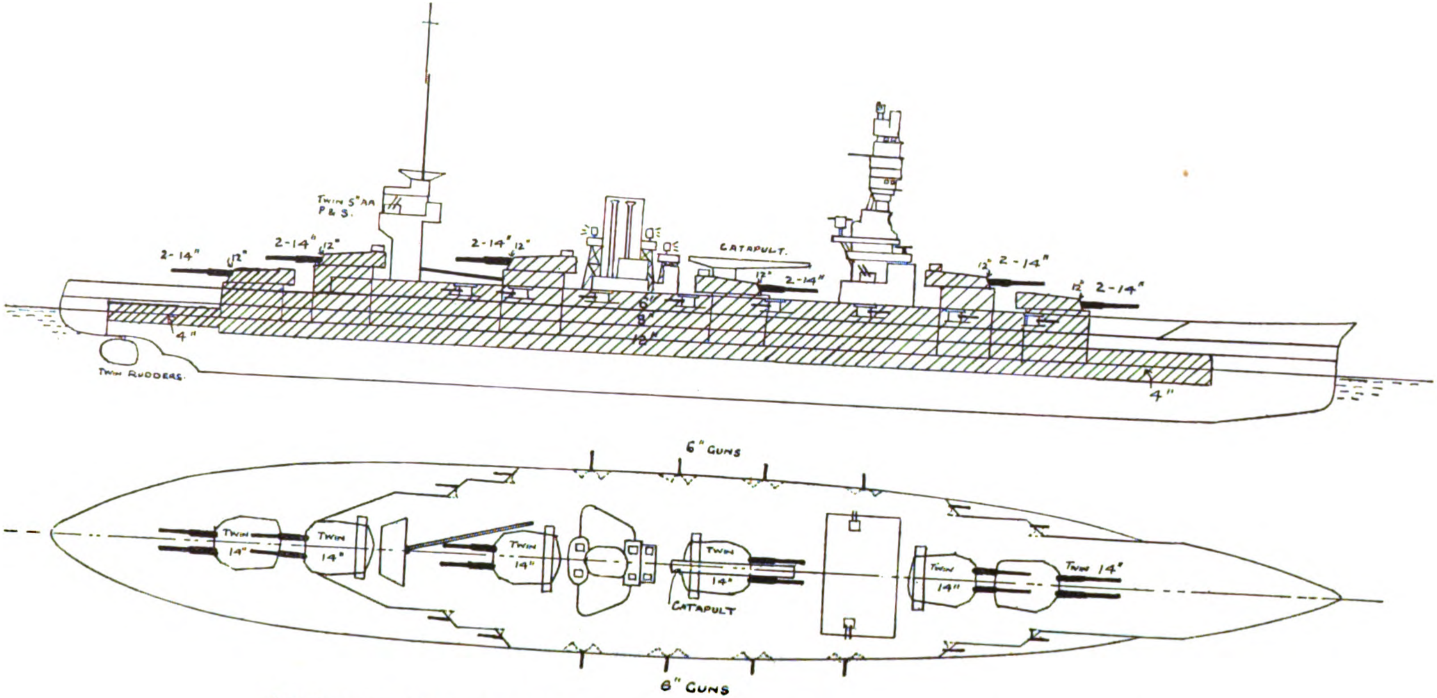
JAPAN.

BATTLESHIPS.

"Fuzo" Class.

Fuzo. **Yamashiro.**

(After reconstruction, 1934.):



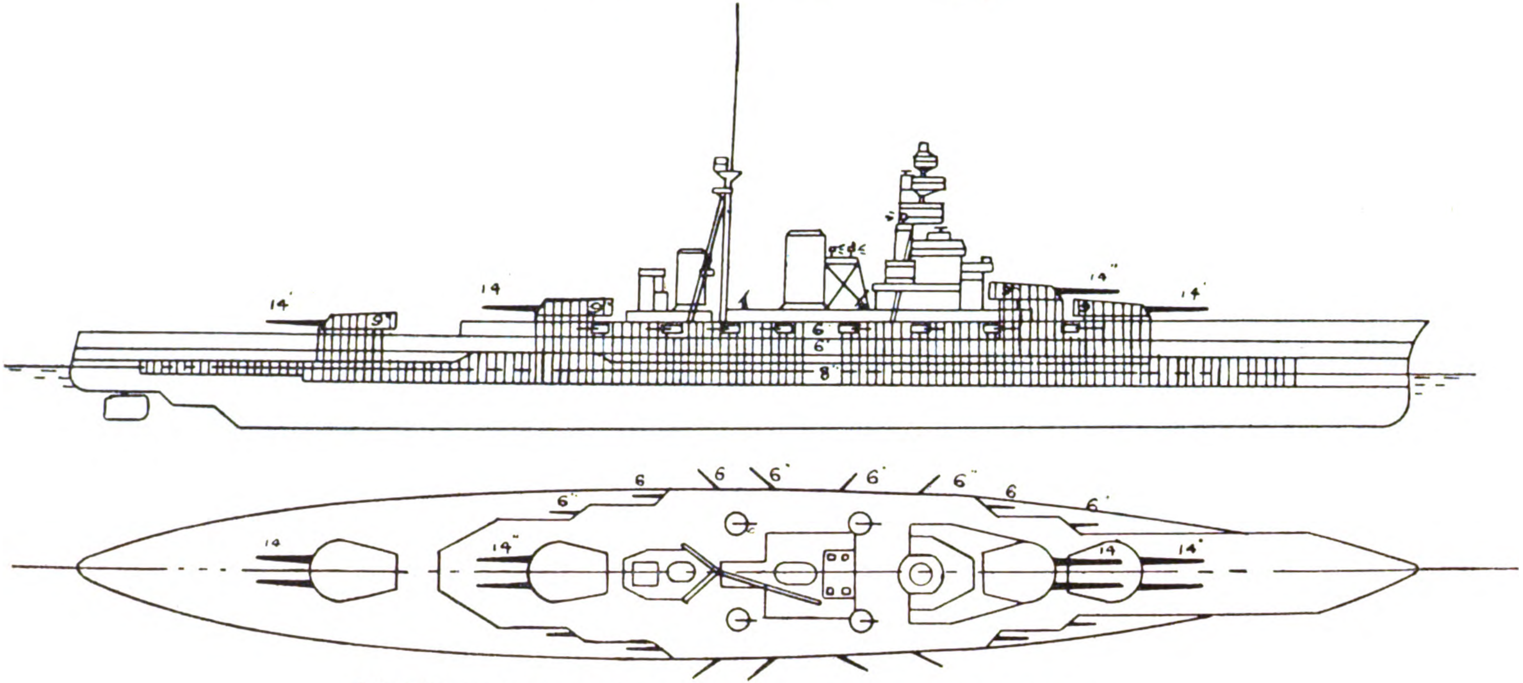
Length (extreme), 673 ft. ; Length B.P., 630 ft. ; Speed, 22¼ knots ; 29,330 tons (standard) ; Completed, 1915.
Armament, 12—14-in. ; 16—6-in. ; 8—5-in. A.A. ; 4 M.G. ; 4 L. ; 2 submerged 21-in. torpedo tubes.
1 catapult ; 1 seaplane.

JAPAN.

BATTLESHIPS.

"Kongo" Class.

Haruna. **Kirishima.** **Kongo**



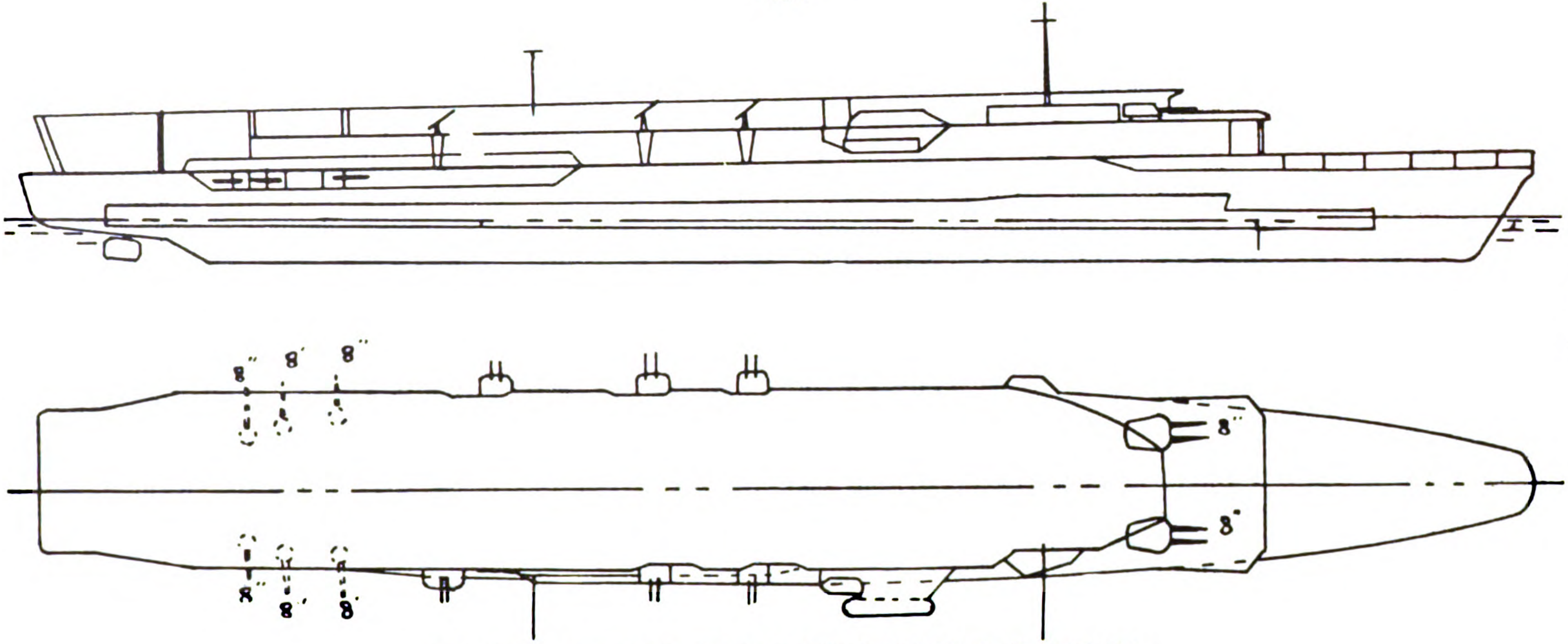
Length (extreme), 704 ft. ; Speed, 26 knots ; 29,330 tons ; Completed, 1914-15 ; Modernised 1928-31.
Armament, 8—14-in. ; 16—6-in. ; 4—3-in. A.A. ; 4 submerged 21-in. torpedo tubes.

Hiyei of this class has been converted to a Training Ship in accordance with the London Naval Treaty.

JAPAN.

AIRCRAFT CARRIER.

Akagi.

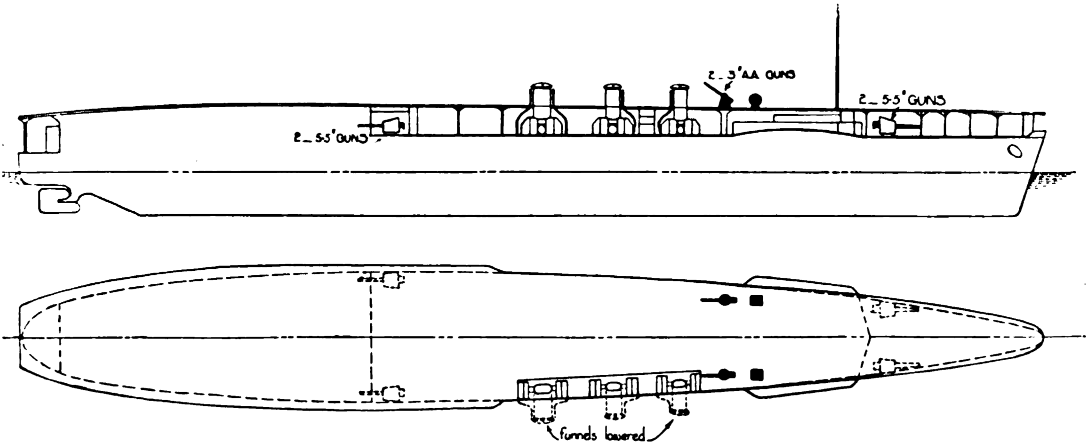


Length (between perpendiculars), 763 ft. ; 26,900 tons ; Speed, 28·5 knots ; Completed, 1927
Armament, 10—8-in. ; 12—4·7-in. A.A. Accommodation for 50 planes.

JAPAN.

AIRCRAFT CARRIER.

Hosho

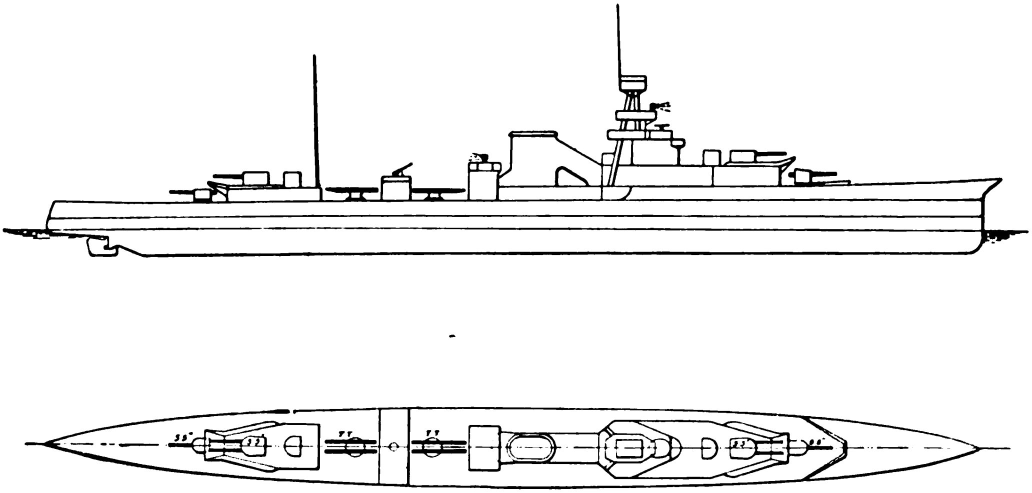


Displacement, 7,470 tons; Length B.P., 510 ft.; Speed, 25 knots; Completed, 1922.
Armament, 4—5·5-in.; 2—3-in. A.A.; Carries about 28 planes; Fitted with gyro-stabiliser.

JAPAN.

LIGHT CRUISER

Yubari.

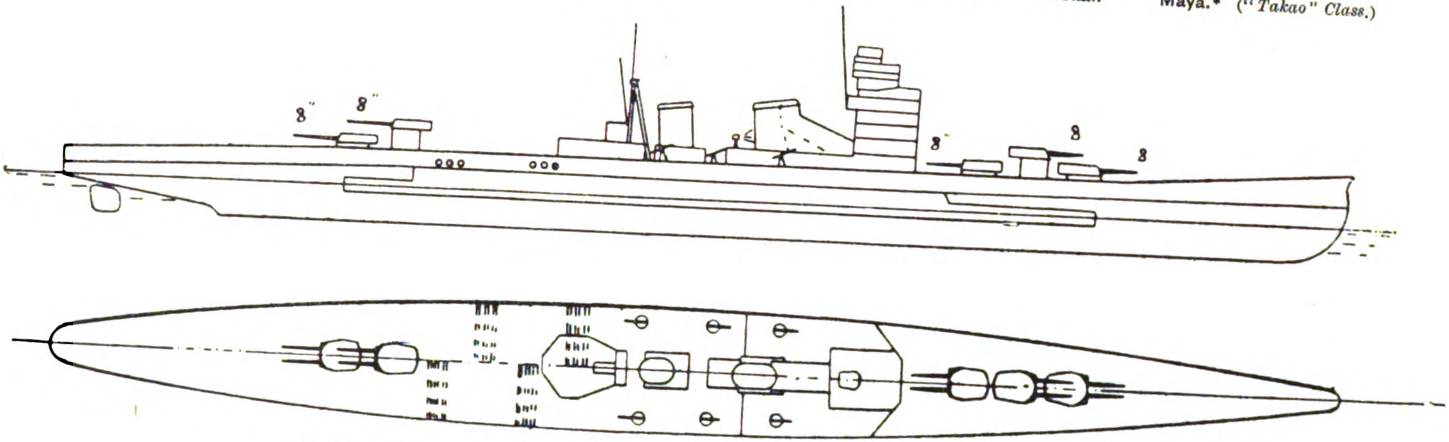


Length (extreme), 465 ft.; Length B P., 435 ft.; 2,890 tons; Speed, 33 knots. Completed, 1923.
Armament, 6—5·5-in.; 1—3 in. A.A.; 2 M.; 2 twin 21-in. torpedo tubes; 34 mines.

JAPAN.

CRUISERS.

Nachi. **Myoko.** **Ashigara.** **Haguro.** (*"Nachi" Class.*) **Atago.*** **Takao.*** **Chokai.*** **Maya.*** (*"Takao" Class.*)



Length (between perps.), 630 ft.; "Nachi" Class, 10,000 tons; "Takao' Class, 9,850 tons; speed, 33 knots.
Armament, 10—8-in.; 6—4·7-in. A.A.; 12—21-in. torpedo tubes.

* These have 4—4·7-in. A.A., and 8–21-in. torpedo tubes.

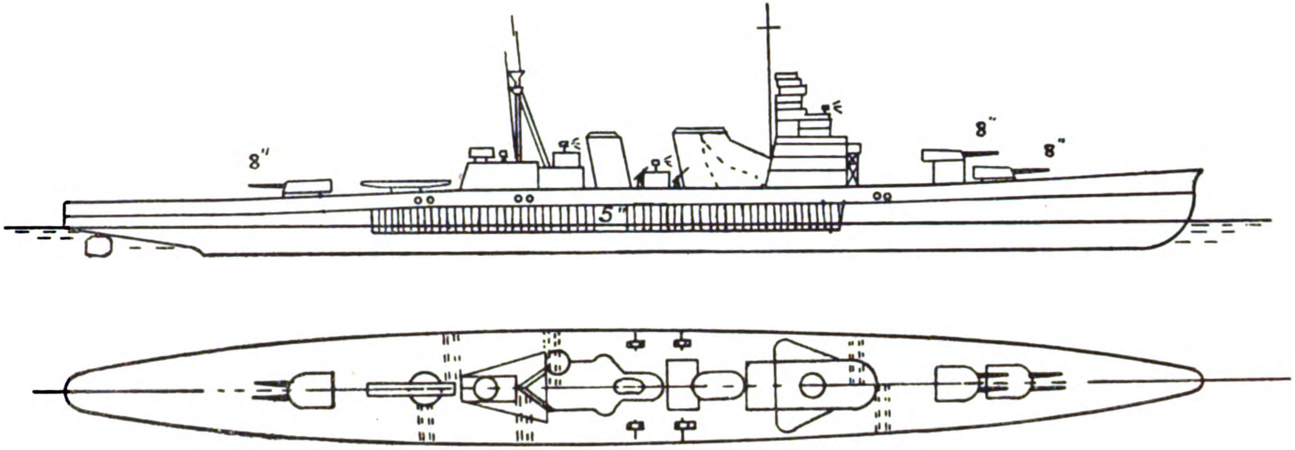
Corrections to plan: In the "Takao" class the after funnel is vertical, and the torpedo tubes are beneath the funnels on a deck higher. The four 4·7-in. A.A. guns are also a deck higher. In the "Nachi" Class the foremost pair of 4·7-in. A.A. guns are a deck higher.

JAPAN.

CRUISERS.

"*Furutaka*" Class.

Aoba. **Kinugasa**



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots.
Armament, 6—8-in. ; 4—4·7-in. A.A. ; 12—21-in. torpedo tubes.
1 catapult ; 2 aircraft.

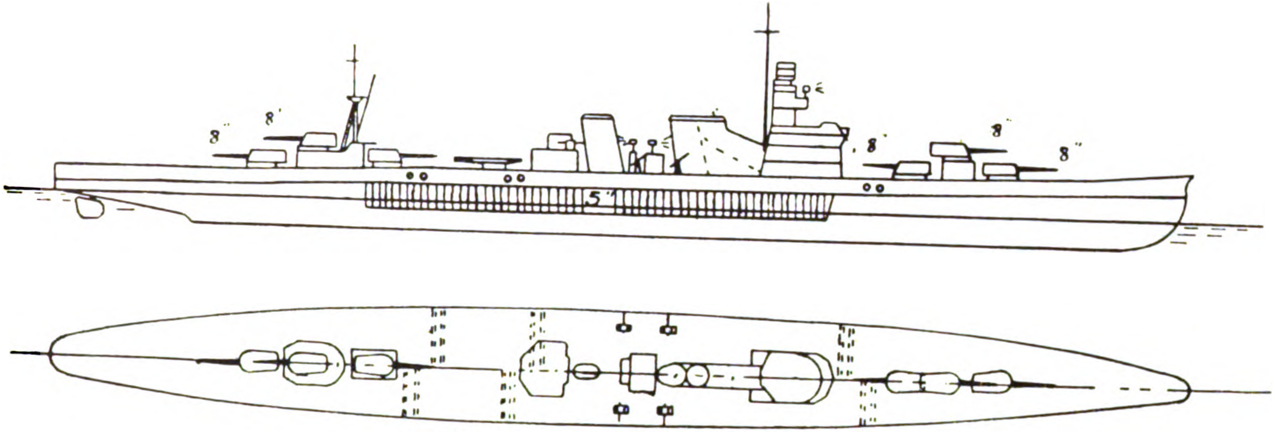
Correction to plan : The tops of the funnels are square to the funnels.

JAPAN.

CRUISERS.

Furutaka ' *Class.*

Furutaka. **Kako.**



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots.
Armament, 6—8-in. ; 4—3-in. A.A. ; 12 above-water 21-in. torpedo tubes.
1 catapult ; 1–2 aircraft.

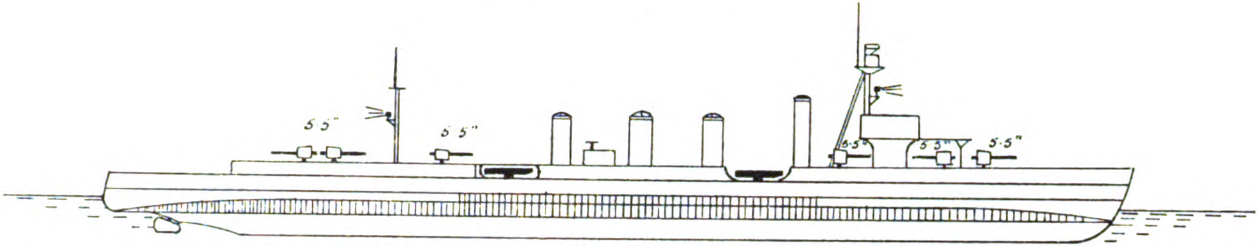
Correction to plan : The tops of the funnels are square to the funnels.

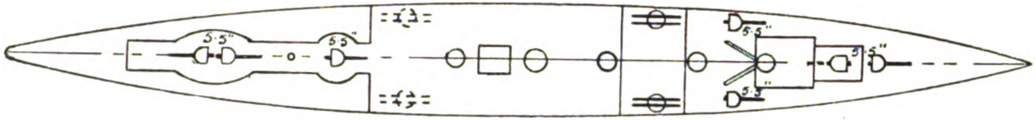
JAPAN.

LIGHT CRUISERS.

"Sendai" Class.

Naka. **Sendai.** **Jintsu.**





Length (extreme), 535 ft. ; Speed, 33 knots ; 5,195 tons ; Completed, 1924–25.
Armament, 7—5·5-in. ; 2—3-in. A.A. ; 4 twin 21-in. torpedo tubes.
1 seaplane.

Correction to plan : Bows of Jintsu and Naka have been modified to give more flair.

JAPAN.

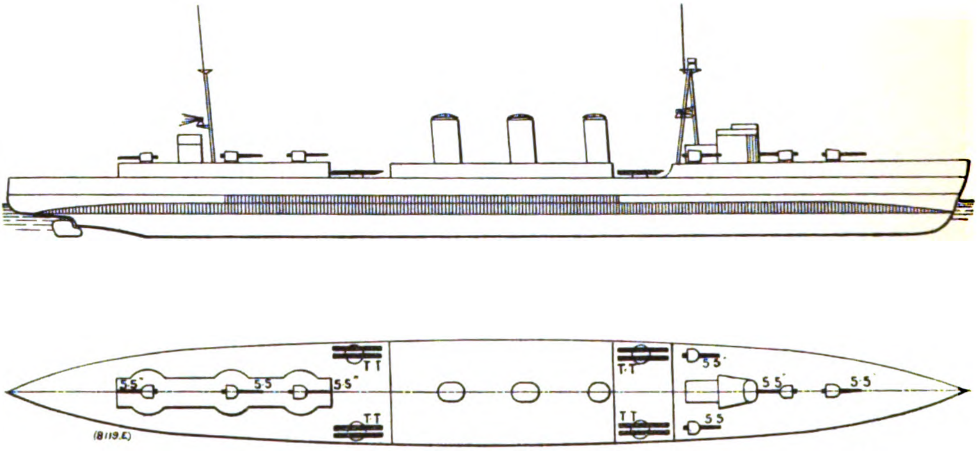
LIGHT CRUISERS.

"*Natori*" *Class.*

* Isudzu. Nagara. * Natori. Yura. * Kinu. Abukuma.

"*Kuma*" *Class.*

Oi. **Kiso.** **Kitakami** **Tama** **Kuma.**



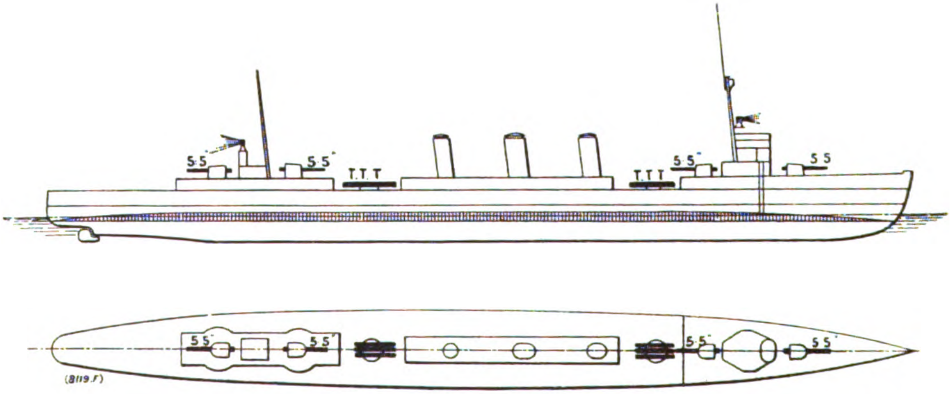
Length (extreme), 535 ft.; Length B.P., 500 ft.; Speed, 33 knots; 5,100 tons; Completed, 1920–21.
Armament, 7—5·5-in.; 2—3-in. A.A.; 2 M.; 4 twin above-water 21-in. torpedo tubes.

* Plans apply generally to these vessels except that aircraft hangar and a catapult are arranged in bridge structure. The displacement is 70 tons higher than Oi, etc. These vessels were completed, 1922–23.

LIGHT CRUISERS.

"*Tenryu*" *Class.*

Tatsuta. **Tenryu.**

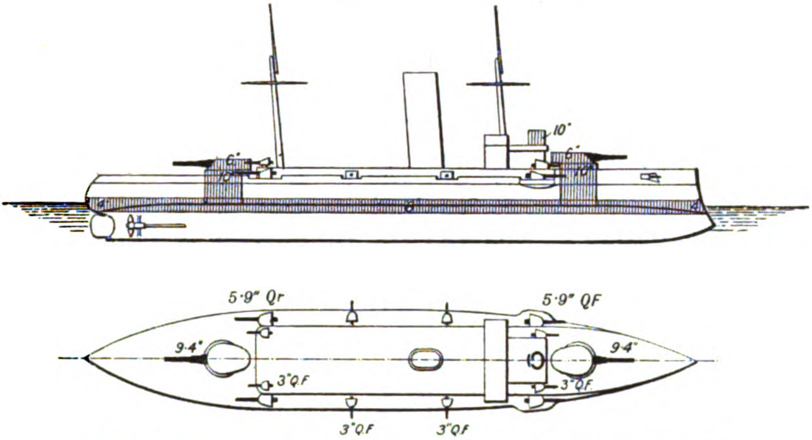


Length (extreme), 468 ft.; Speed, 31 knots; 3,230 tons; Completed, 1919.
Armament, 4—5·5-in.; 1—3-in. A.A.; 2 M.; 2 triple above-water torpedo tubes.
Fitted for Minelaying.

NETHERLANDS.

COAST DEFENCE SHIPS.

Hertog Hendrik. **Marten Tromp.**



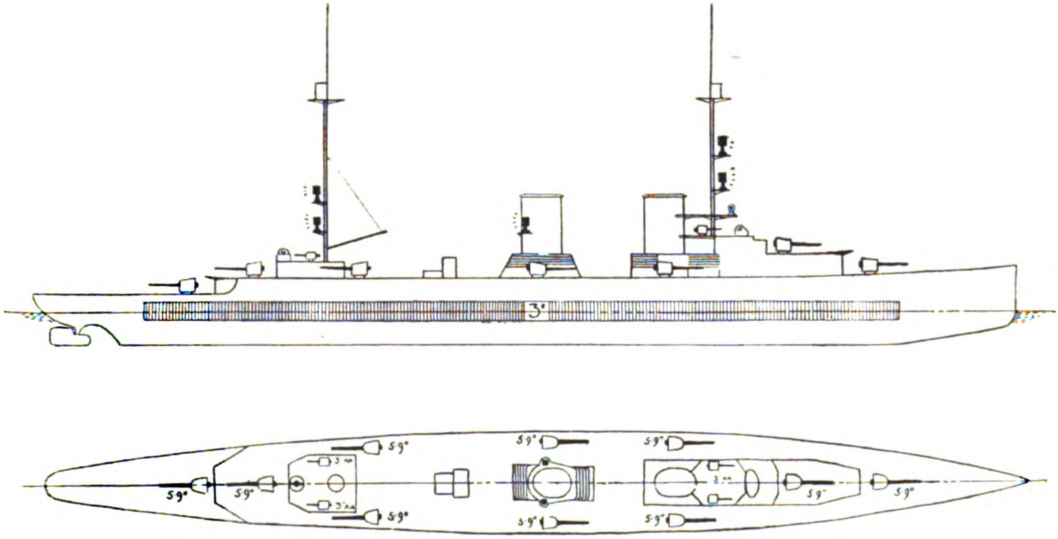
Hertog Hendrik: Length, 317 ft.; 4,371 tons; Speed, 16 knots; Completed, 1903.
2—9·4-in.; 6—5·9-in.; 4—3-in.; 7 small.

Marten Tromp: Length, 330 ft.; 4,562 tons; Speed, 16 knots; Completed, 1906.
2—9·4-in.; 4—5·9-in.; 8—3-in.; 7 small.

NETHERLANDS.

CRUISERS.

Java. **Sumatra.**

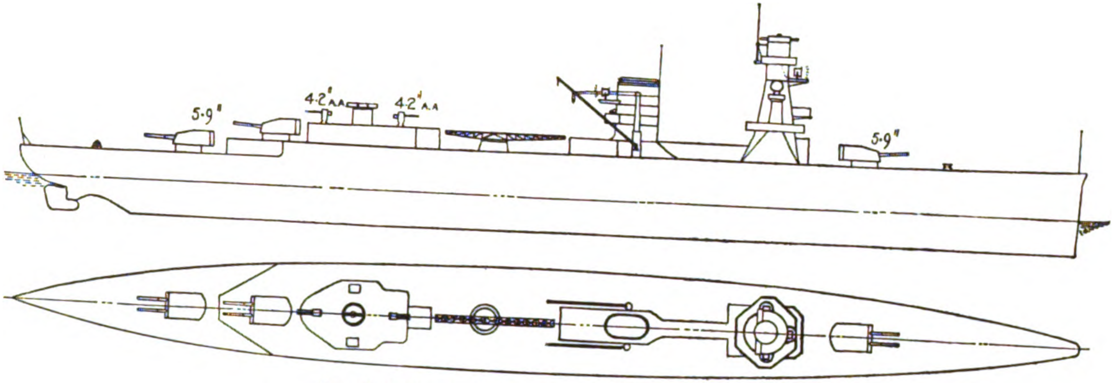


Length, 509½ ft.; 6,670 tons; Speed, 30 knots; Completed, 1925–26
Armament, 10—5·9 in.; 4—3-in. A.A.; 8 M.
40 mines; 2 seaplanes.

NETHERLANDS.

CRUISER.

Celebes



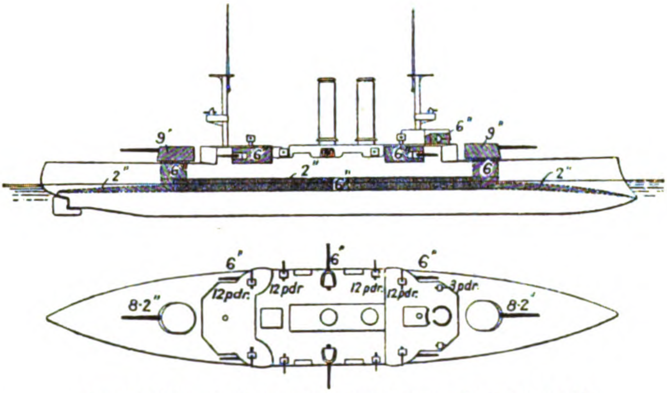
Length (extreme), 560 ft.; 5,900 tons; Speed, 32 knots.
Armament, 6—5·9-in.; 4—4·2-in. A.A.; 4 M.; 1 catapult; 2 seaplanes.

Building at Rotterdam

NORWAY.

COAST DEFENCE SHIPS.

Norge. **Eidsvold**

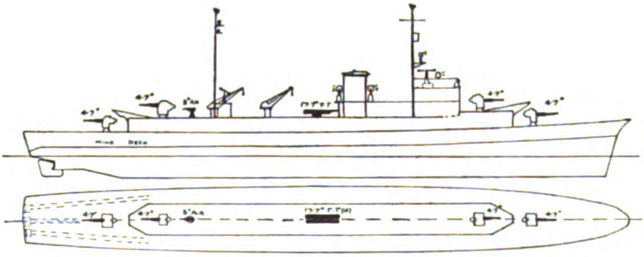


Length, 310 ft. ; 4,166 tons ; Speed, 16·5 knots ; Completed, 1901.
Armament, 2—8·2-in. ; 6—6-in. ; 8—3-in. ; 6—3-pr. ; 2 submerged 18-in. torpedo tubes.

NORWAY.

MINELAYER AND TRAINING SHIP.

Clav Trygvason.

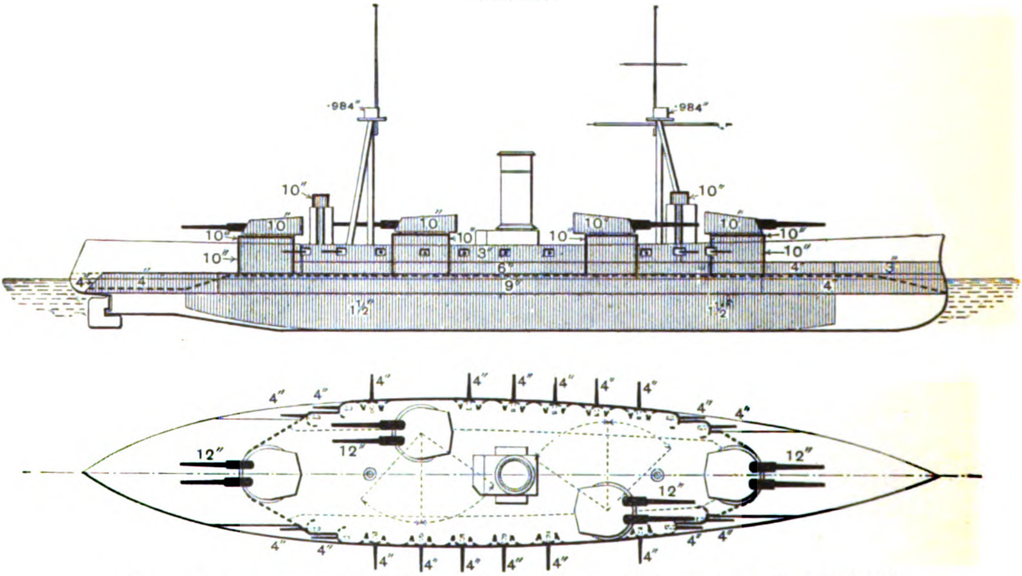


Length, 319¼ ft. ; 1,747 tons ; speed, 21¾ knots ; Completed, 1934.
Armament, 4—4·7-in. ; 1—3-in. A.A. ; 2—17·7-in. torpedo tubes.
280 mines.

SPAIN.

BATTLESHIP.

Jaime I.

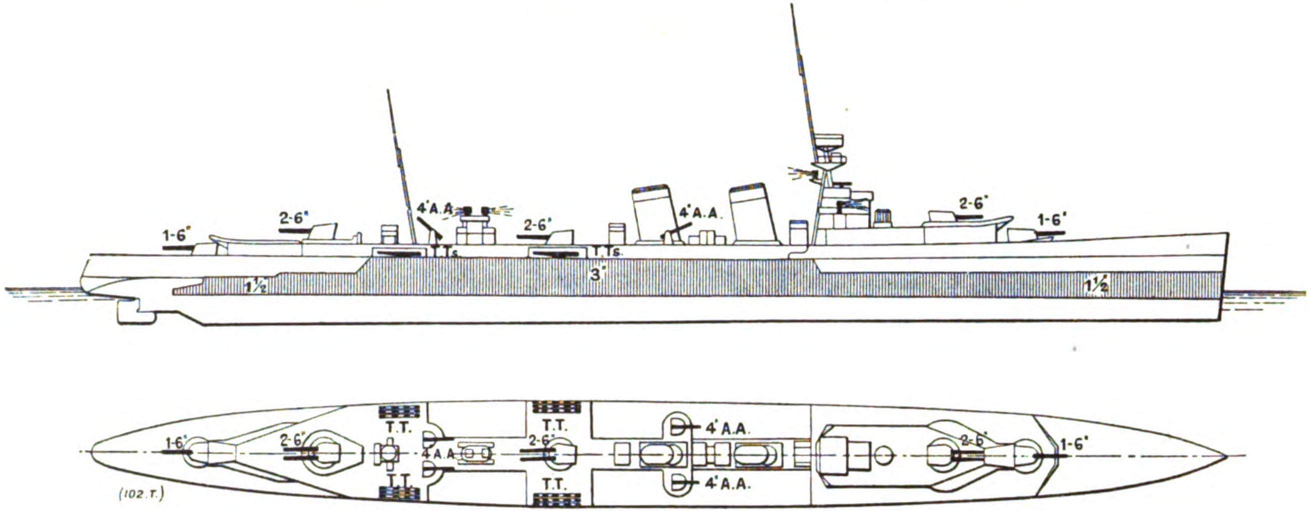


Length (extreme), 459 ft. ; Length W.L., 435 ft. ; 14,224 tons ; Speed, 19·5 knots ; Completed, 1921.
Armament, 8—12-in. ; 20—4-in. ; 4—3-pr. ; 4—3 pr. A.A. ; 2 M.

SPAIN.

CRUISERS.

Libertad (*ex*-Principe Alfonso). Almirante Cervera. Miguel de Cervantes.



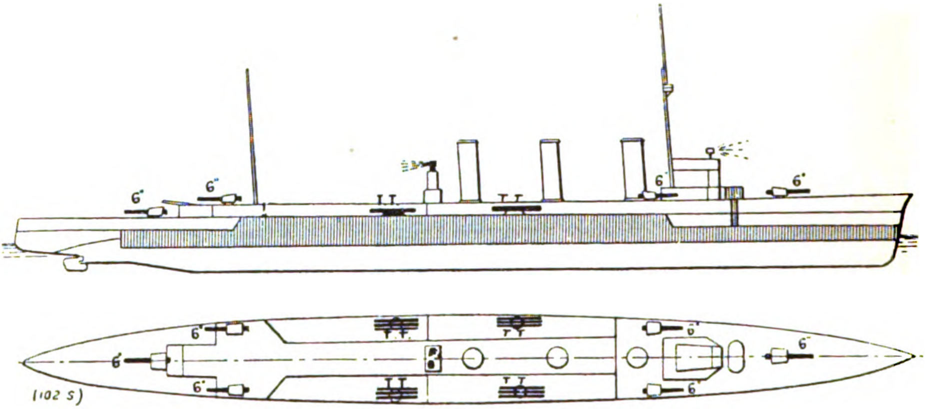
Length (extreme), 579 ft. 6 ins. ; Length B.P., 545 ft. ; 7,475 tons ; Speed, 33 knots.
Armament, 8—6-in. ; 4—4-in. A.A. ; 2—3 pr. ; 4 triple above-water torpedo tubes (21-in. torpedoes).

Corrections to plan : The mainmast is tripod. There is no foretopmast.

SPAIN.

LIGHT CRUISER.

Mendez Nuñez.

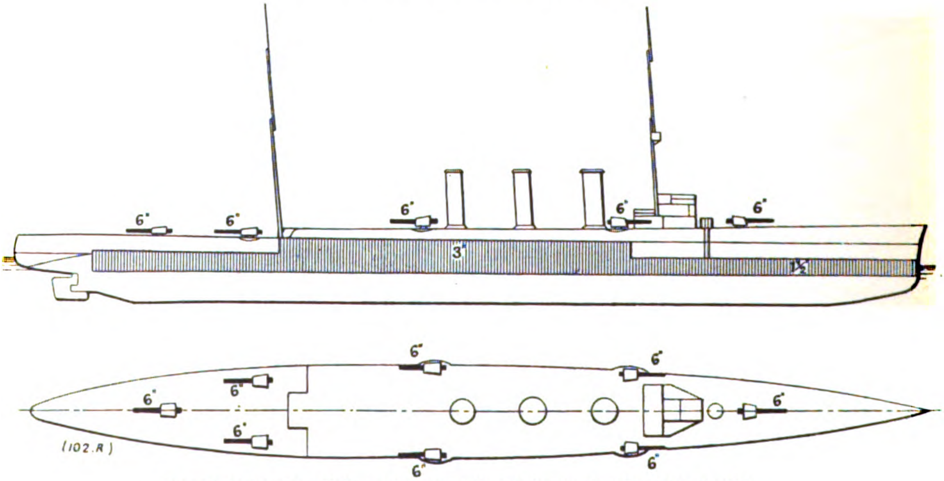


Length (extreme), 462 ft. ; Length B.P., 439 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.
Armament, 6—6-in. ; 4—3-pr. A.A. ; 4 M. ; 4 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

LIGHT CRUISER.

Republica (*ex*-Reina Victoria Eugenia).



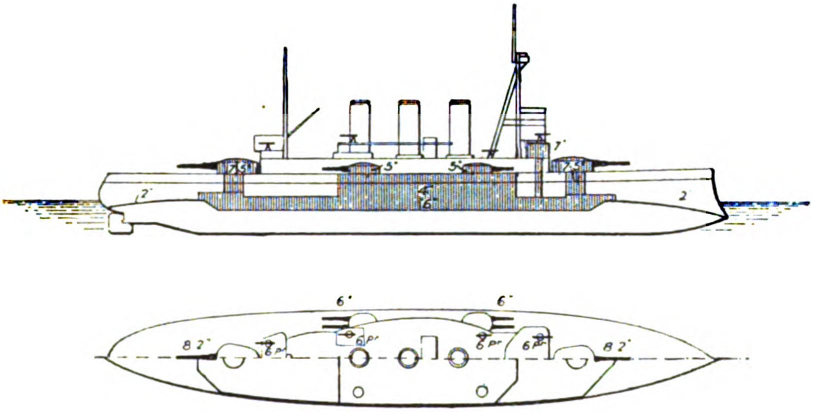
Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1922.
Armament, 9 *—6-in. ; 1—3-in. ; 4—3-pr. A.A. ; 4 M. ; 1 L. ; 4—21-in. torpedo tubes.

* Correction to plan : There should be two 6-in. guns abreast forward instead of one on the centre line as shown.

SWEDEN.

BATTLESHIP.

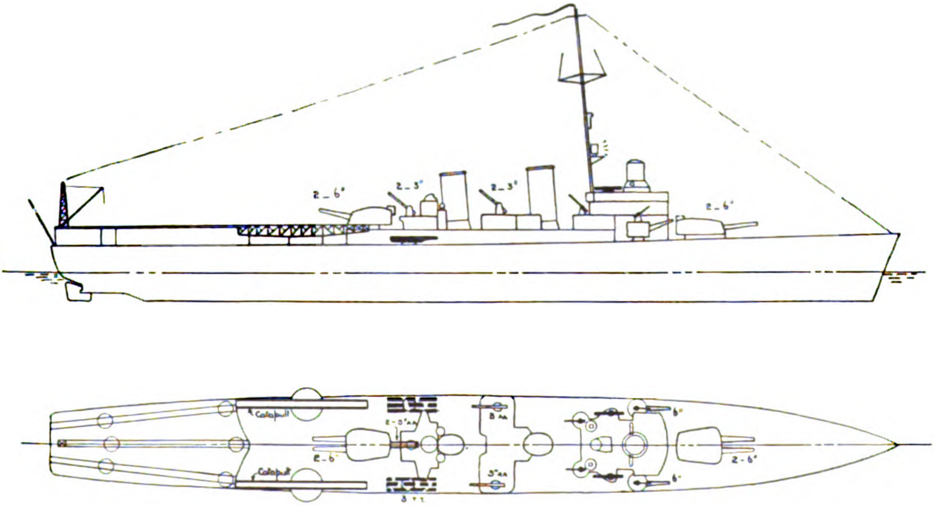
Oscar II.



Length, 313·6 ft. ; 4,085 tons ; Speed, 18 knots ; Completed, 1907.
Armament, 2—8·2-in. ; 8—6-in. ; 8—6-pr. ; 1—1-pr ; 2 submerged 18-in. torpedo tubes.

AIRCRAFT CRUISER.

Gotland.



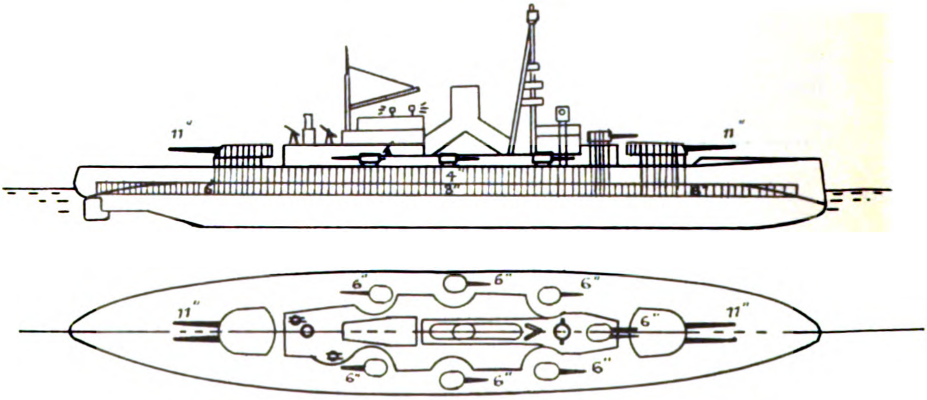
Length, 442 ft. ; 4,527 tons ; 33,000 H.P. ; Speed, 27 knots. Building (estimated completion, 1934).
Armament, 6–6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes.

Correction to plan : 1 middle line catapult will be fitted instead of two.

SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. **Sverige.**
(As reconstructed 1924–29.)

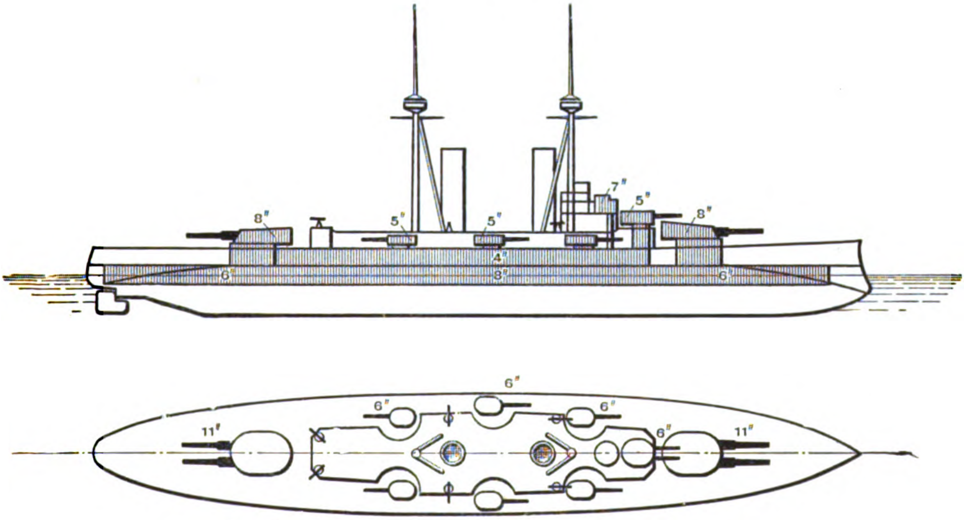


Length, 396·7 ft. ; 6,899 tons ; Speed, 22 knots ; Completed, 1917–1921.
Armament, 4—11-in. ; 8—6-in. ; 6–3-in. ; 2–6-pr. ; 2 M.

SWEDEN.

COAST DEFENCE SHIP.

*Drottning Victoria.



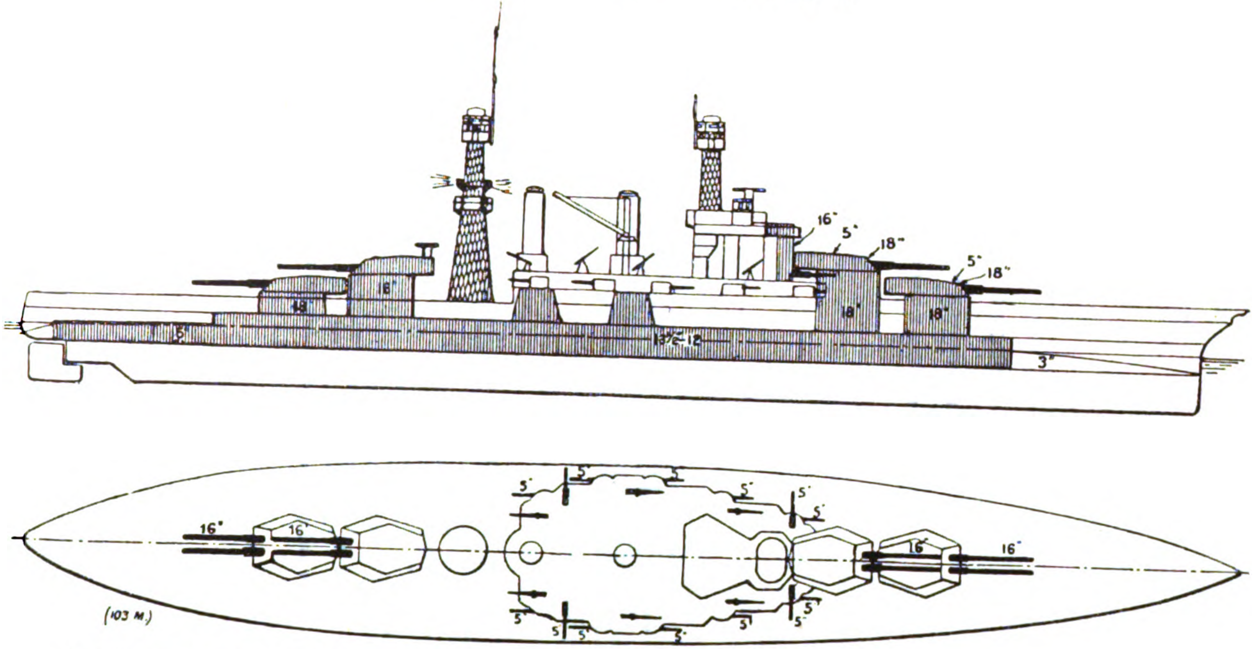
Length, 396·7 ft.; 6,899 tons; Speed, 23 knots; Completed, 1921.
Armament, 4—11-in.; 8—6-in.; 6—3-in.; 2—6-pr.; 2 M.

* To be reconstructed and modernised as Gustav V and Sverige.

UNITED STATES.

BATTLESHIPS.

Colorado. **Maryland.** **West Virginia.**



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,600 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

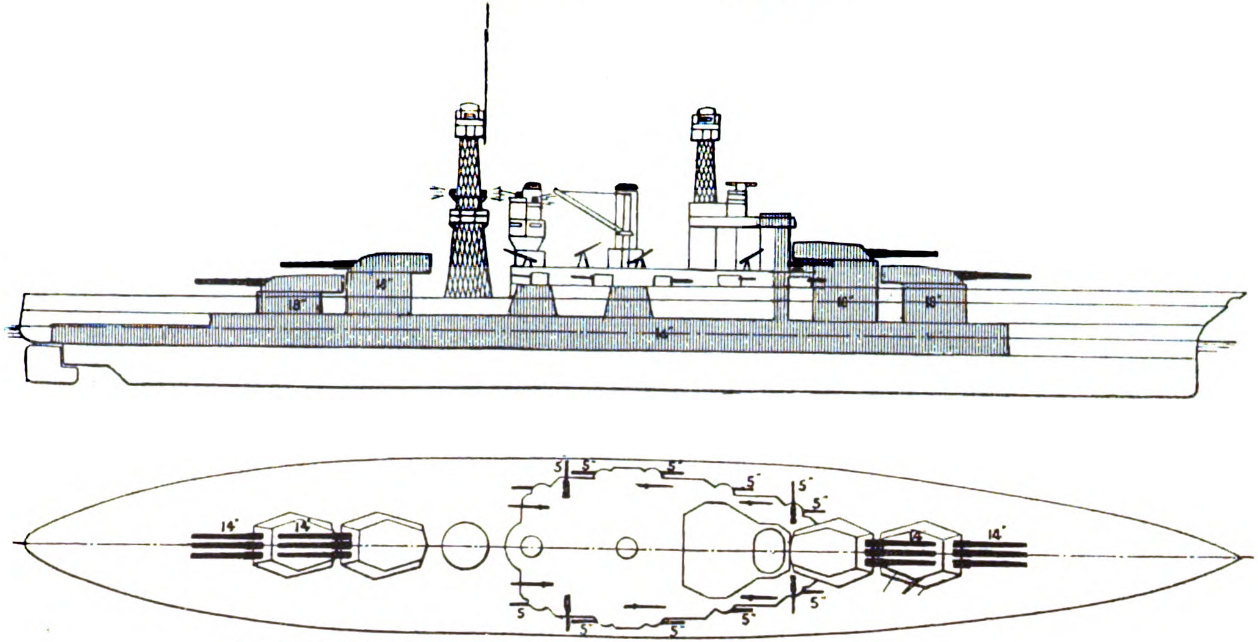
Armament 8—16-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2 submerged 21-in. torpedo tubes.

Catapult mounted right aft on Quarter Deck ; 3 aircraft.

UNITED STATES.

BATTLESHIPS.

California. **Tennessee.**



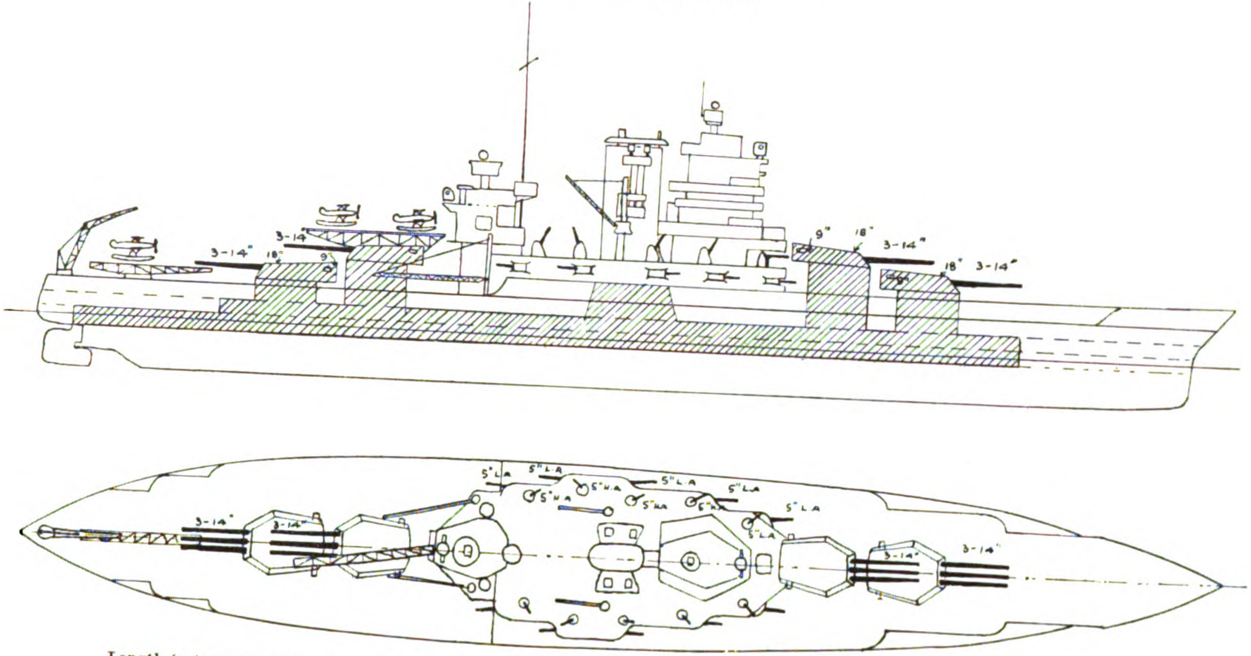
Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,300 tons ; Completed, 1920–21.
Armament, 12—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2—1-pr. ; 2 submerged 21-in. torpedo tubes.
2 catapults (one right aft on Quarter Deck and one on the third turret) ; 3 seaplanes.

UNITED STATES.

BATTLESHIPS.

Idaho. New Mexico Mississippi

(After modernisation 1934.)



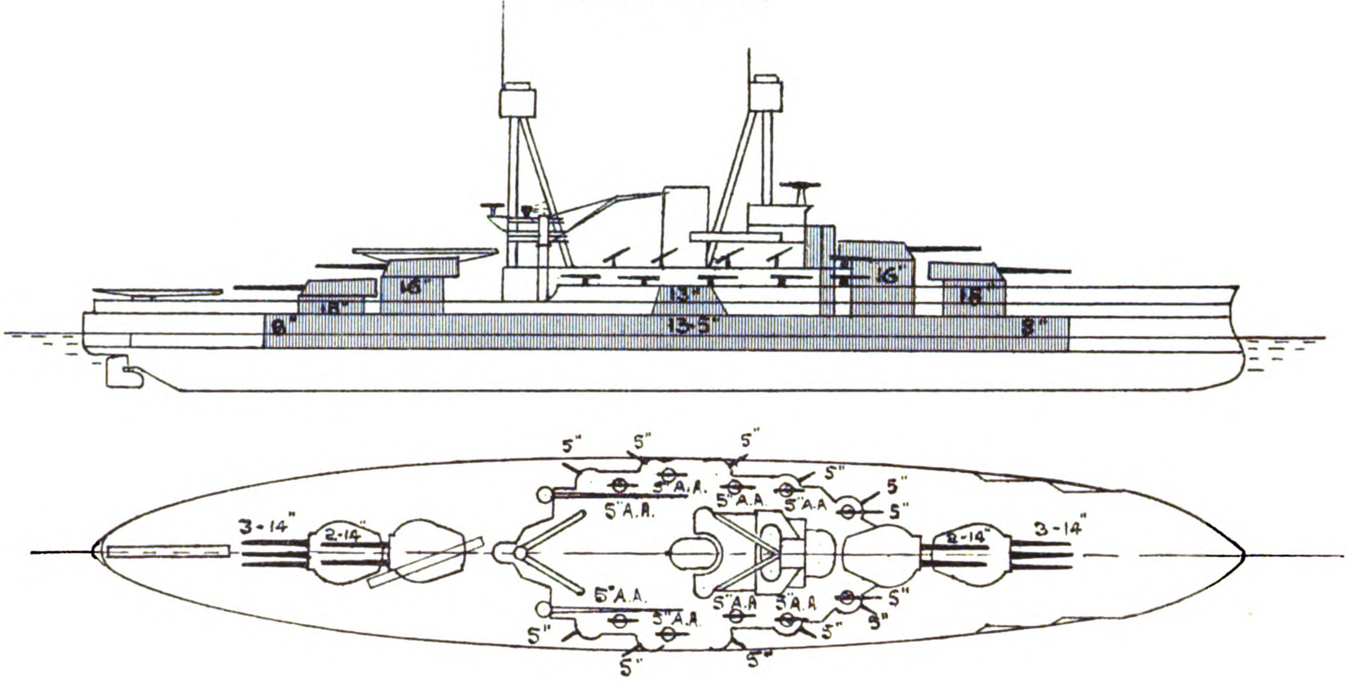
Length (extreme), 624 ft. ; Length, W.L., 600 ft. ; Speed, 22½ knots ; 33,000 tons : Completed, 1917–1919 ; Modernised, 1931–1934. Armament, 12—14 in.; 12—5-in. ; 8—5-in. A.A. ; 4—6 pr. (Idaho, 4—3 pr.); 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 seaplanes.

UNITED STATES.

BATTLESHIPS.

Nevada. **Oklahoma.**

(As reconstructed 1929.)



Length (extreme), 583 ft. ; Length W.L., 575 ft. ; Speed, 20·5 knots ; 29,000 tons.

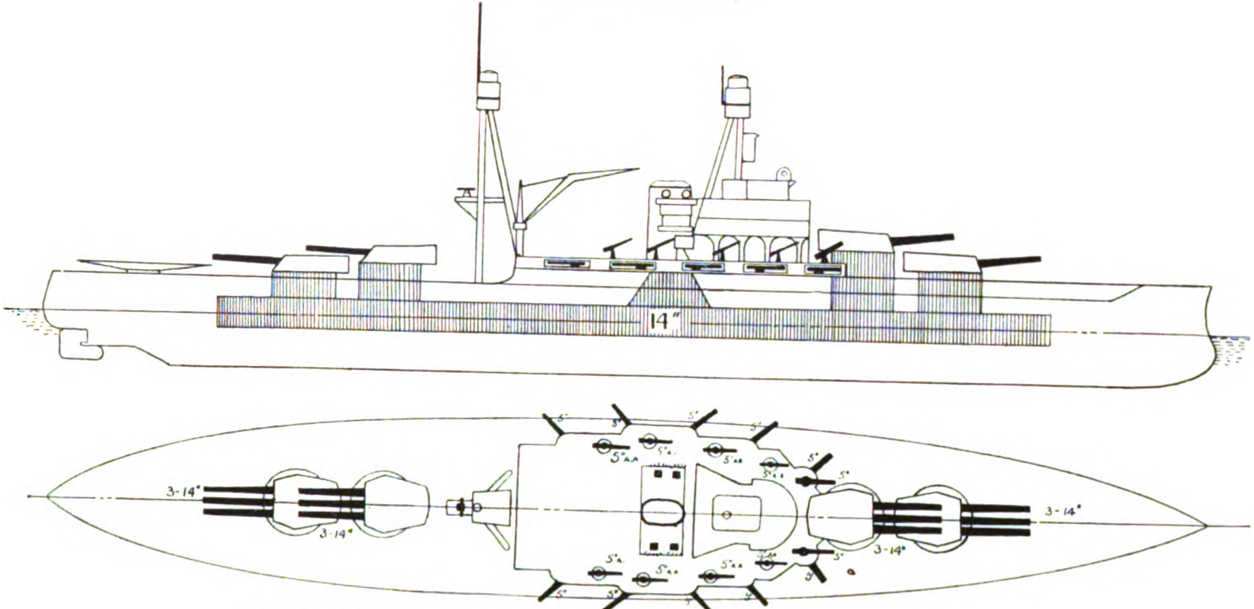
Armament, 10—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. Oklahoma, 4--3-pr.) ; 2—1-pr. ; 2 M. ; 2 L. ; 2 catapults ; 3 aeroplanes.

UNITED STATES.

BATTLESHIPS.

Arizona. **Pennsylvania.**

(As reconstructed 1931.)



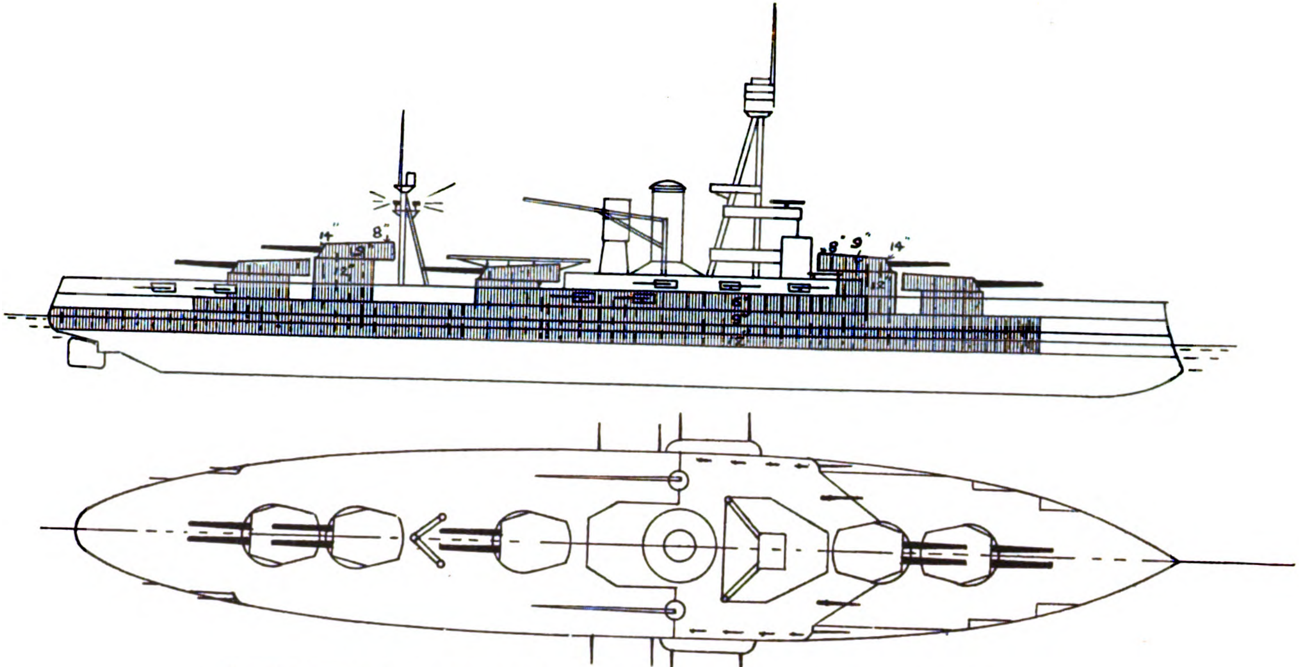
Length (extreme), 608 ft. ; Length B.P., 596 ft. ; Speed, 21 knots ; 32,100 tons ; Completed, 1916.
Armament, 12—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. ; 2 L. 2 catapults ; 3 aircraft.

UNITED STATES.

BATTLESHIPS.

New York. **Texas.**

(As reconstructed 1927.)



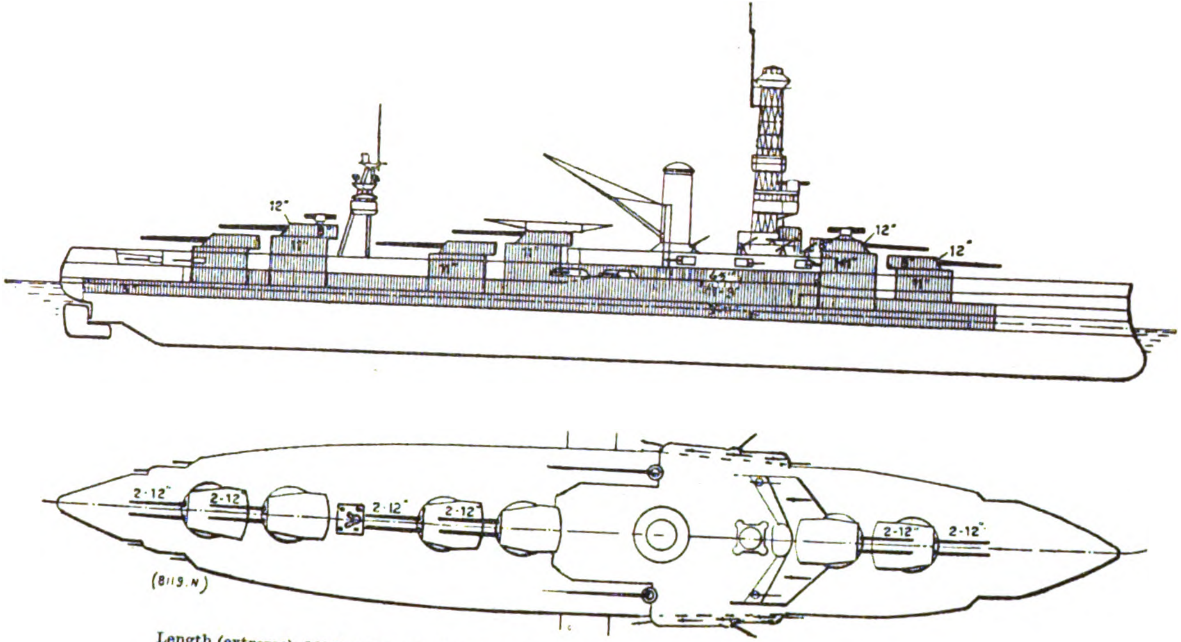
Length (extreme). 573 ft.; Length W.L., 565 ft.; Speed, 21 knots; 27,000 tons; Completed, 1914.
Armament, 10—14-in.; 16—5 in.; 8—3-in. A.A.; 4—3-pr.; 2—1-pr.; 2 M.; 1 catapult; 3 aircraft.

UNITED STATES.

BATTLESHIP.

Arkansas.

(As reconstructed 1927.)



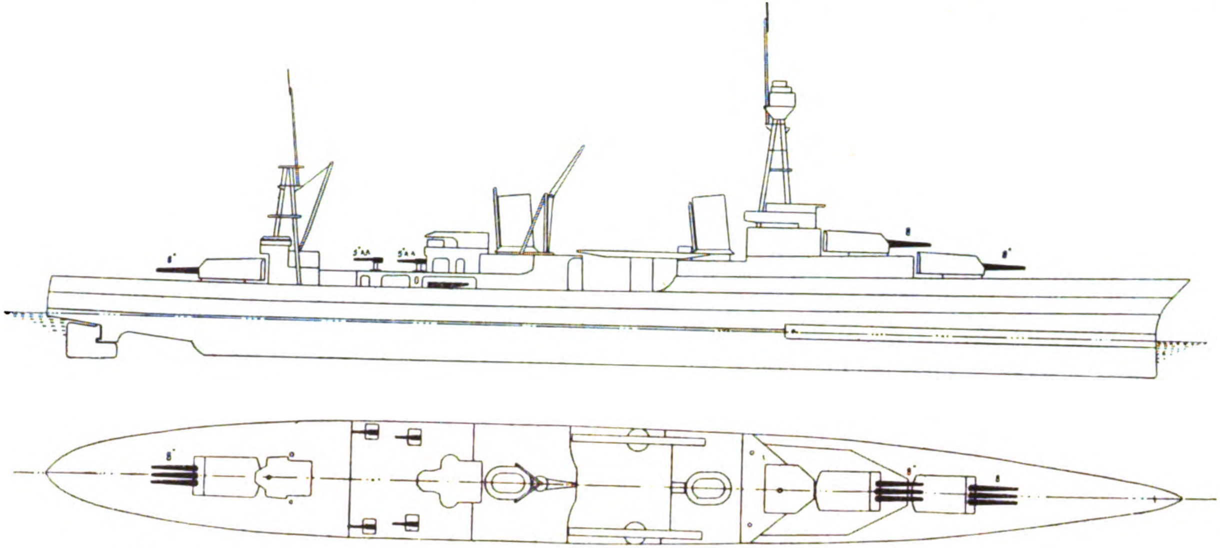
Length (extreme), 562 ft.; Length, W.L., 554 ft.; Speed, 20·5 knots; 26,100 tons; Completed, 1912.
Armament, 12—12-in.; 16—5-in.; 8—3-in. A.A.; 4—3-pr.; 2—1-pr.; 2 M.; 1 catapult; 3 aircraft.

Wyoming, a sister ship, has been demilitarised and converted to a training ship.

UNITED STATES.

CRUISERS.

Northampton **Chester.** **Louisville.** (“*Chester*” *Class.*) **Chicago.** **Houston.** **Augusta.** (“*Augusta*” *Class.*)



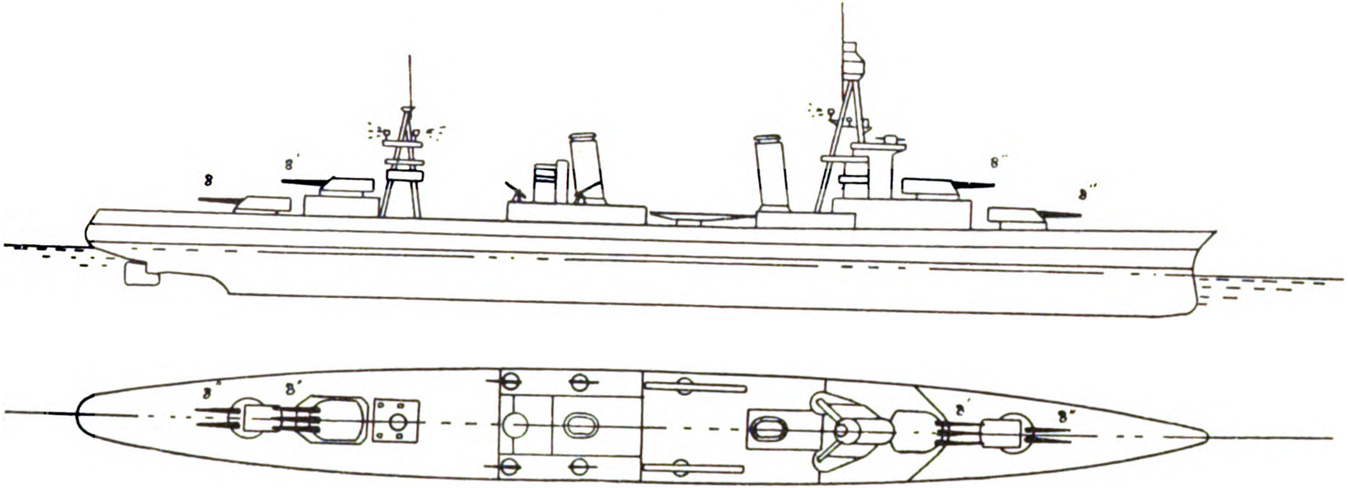
“Chester” and “Augusta” Classes: Length (extreme), 600 ft.; 9,050–9,300 tons; Speed, 32·5 knots; Completed, 1930–31. Armament, 9—8-in.; 4—5-in. A.A.; 2—3-pr.; 2 triple 21-in. torpedo tubes; 2 catapults; 4–6 seaplanes.

UNITED STATES.

CRUISERS.

"*Pensacola*" *Class.*

Salt Lake City. **Pensacola.**



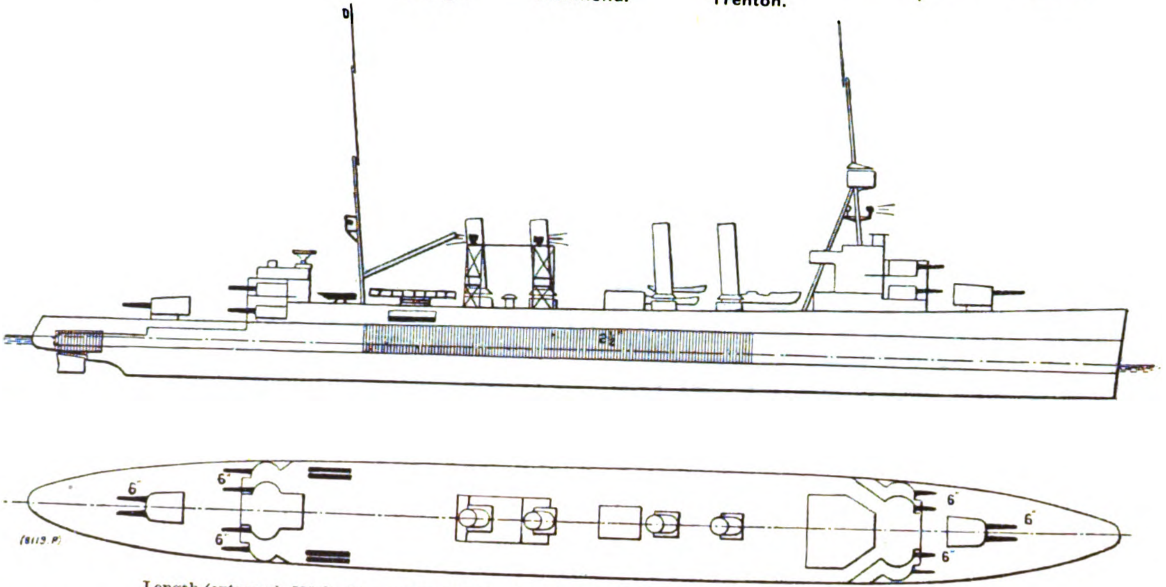
Length (extreme), 585½ ft. ; 9,100 tons ; Speed, 32½ knots ; Completed, 1930.
Armament, 10—8-in. ; 4—5-in. A.A. ; 2—3-pr. ; 2 triple 21-in. torpedo tubes.
2 catapults :4 seaplanes.

UNITED STATES.

SCOUT CRUISERS.

"Omaha" Class.

Cincinnati. **Concord.** **Detroit.** **Raleigh.** **Marblehead.** **Richmond.** **Memphis.** **Trenton.** **Milwaukee.** **Omaha.**



Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 33·7 knots; 7,050 tons. Completed in 1923-25.

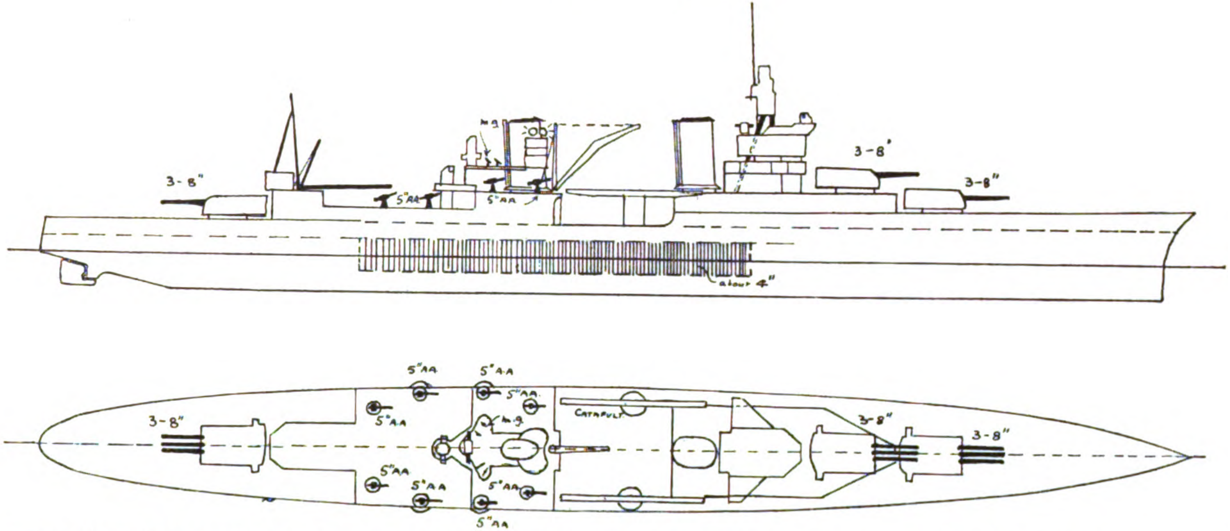
Armament, 12–6-in. (Marblehead, 11–6-in.; Cincinnati, Detroit, Raleigh and Richmond, 10–6-in.); 4–3-in. A.A.; 2–3-pr.; 2 triple above-water 21-in. torpedo tubes; 2 catapults; 2 aeroplanes.

Corrections to plan: The pair of single 6-in. guns at upper deck level aft are removed in Marblehead, Cincinnati, Detroit, Raleigh and Richmond. In Marblehead there is a single gun on top of the after battery.

UNITED STATES.

CRUISERS.

Indianapolis. **Portland.**



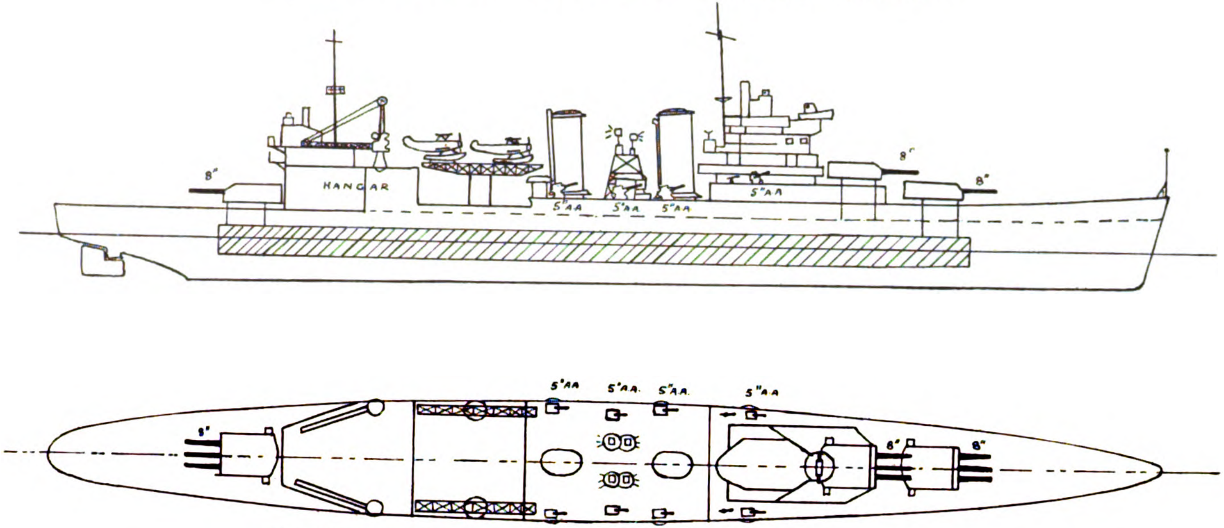
Length, Indianapolis, 584 ft. on W.L.; Portland, 582 ft. on W.L. Indianapolis, 9,950 to s; Portland, 9,800 tons. Speed, 32¼ knots. Completed, 1932–1933.
Armament, 9—8-in., 8—5-in. A.A.; 10 machine guns; 2 catapults; 4–6 aircraft.

UNITED STATES.

CRUISERS.

"Astoria" Class.

Astoria. New Orleans. San Francisco. Minneapolis. Tuscaloosa.

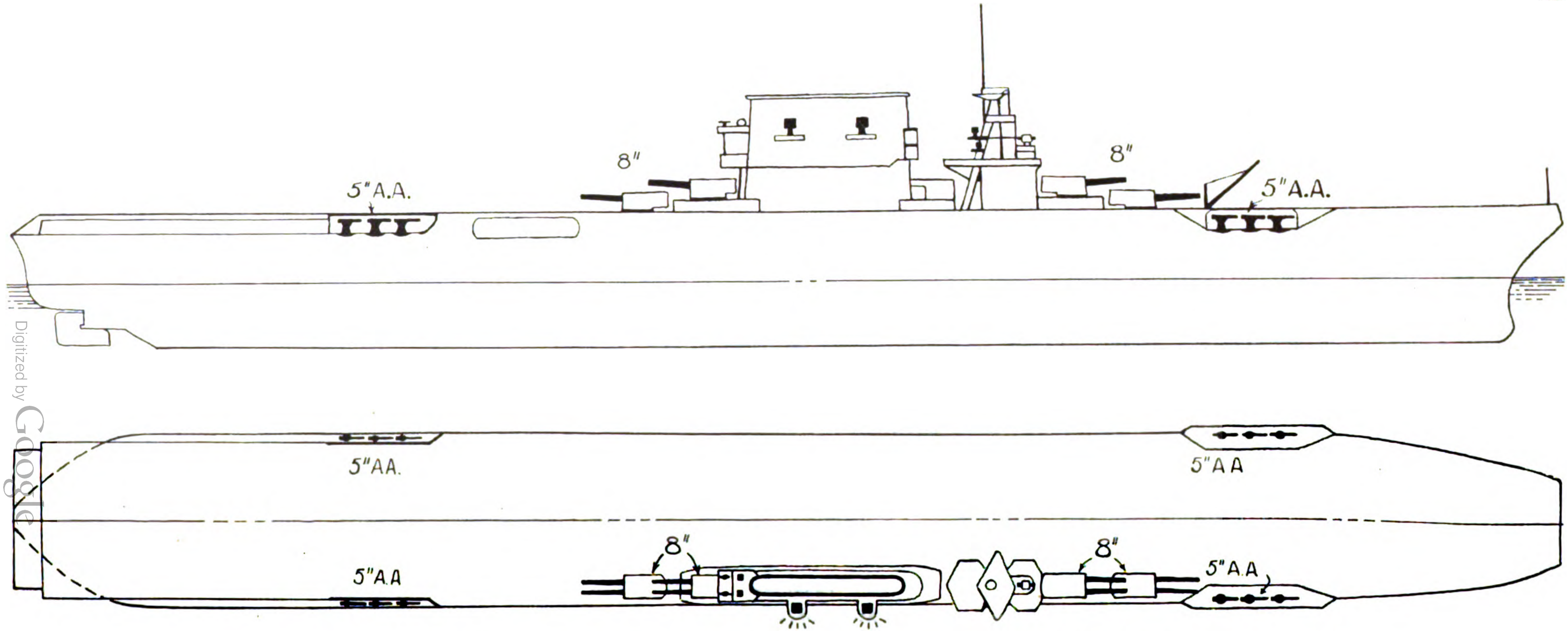


Length (extreme), 578 ft. 10,000 tons (estd.). Speed, 32¼ knots. Completed, 1934.
Armament, 9—8-in., 8—5-in., 10 smaller; 2 catapults; 4–6 aircraft.

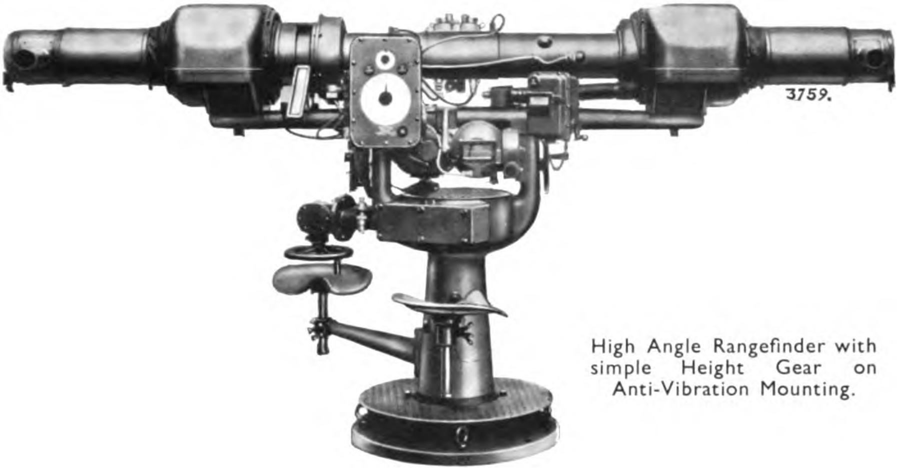
UNITED STATES.

AIRCRAFT CARRIERS.

Lexington. **Saratoga.**



Length (extreme), Lexington, 880 ft. ; Saratoga, 888 ft. ; 33,000 tons ; Speed, 33¼ knots ; Completed, 1927.
Armament, 8—8-in. ; 12—5-in. A.A. ; 4—6-pr. ; Operate about 80 aircraft.



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b. battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *air.c.* aircraft carrier; *air.cr.* = aircraft cruiser; *air.t.* aircraft tender; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser minelayer; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *tr. cr.* training cruiser; *d.* destroyer; *t.b.* torpedo boat; *f.cl.d.* first-class destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *sea-p.c.* seaplane carrier; *a.s.* armoured ship; *a.t.* aviation transport; *m.l. & t.s.* minelaying and training ship.

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b. battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *a.s.* armoured ships; *a.t.* aviation transport; *air.c.* aircraft carrier; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser mine layer; *sea-p.c.* seaplane carrier; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *d.* destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *m.l.&t.s.*=mine layer and training ship; *air. cr.*=aircraft cruiser.

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